### Subduction, underplating, and return flow recorded in the Cycladic Blueschist Unit exposed on Syros Island, Greece

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#### Abstract

Exhumed high-pressure/low-temperature (HP/LT) metamorphic rocks provide insights into deep (~20-70 km) subduction interface dynamics. On Syros Island (Cyclades, Greece), the Cycladic Blueschist Unit (CBU) preserves blueschist-to-eclogite facies oceanic- and continental-affinity rocks that record the structural and thermal evolution associated with Eocene subduction. Despite decades of research on Syros, the pressure-temperature-deformation history (P-T-D), and timing of subduction and exhumation, are matters of ongoing discussion. Here we show that the CBU on Syros comprises three coherent tectonic slices, and each one underwent subduction, underplating, and syn-subduction return flow along similar P-T trajectories, but at progressively younger times. Subduction and return flow are distinguished by stretching lineations and ductile fold axis orientations: top-to-the-S (prograde-to-peak subduction), top-to-the-NE (blueschist facies exhumation), and then E-W coaxial stretching (greenschist facies exhumation). Amphibole chemical zonations record cooling during decompression, indicating return flow along the top of a cold subducting slab. New multi-mineral Rb-Sr isochrons and compiled metamorphic geochronology demonstrate that three nappes record distinct stages of peak subduction (53 Ma, <sup>~</sup>50 Ma (?), and 47 Ma) that young with structural depth. Retrograde blueschist and greenschist facies fabrics span ~50-40 Ma and ~43-20 Ma, respectively, and also young with structural depth. The datasets support a revised tectonic framework for the CBU, involving subduction of structurally distinct nappes and simultaneous return flow of previously accreted tectonic slices in the subduction channel shear zone. Distributed, ductile, dominantly coaxial return flow in an Eocene-Oligocene subduction channel proceeded at rates of ~1.5-5 mm/yr, and accommodated ~80% of the total exhumation of this HP/LT complex.

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#### Key Points:

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9	•	Syros is a tectonic stack composed of 3 slices constructed by subduction and under-
10		plating; peak subduction ages young with structural depth.
11	•	The subduction-to-exhumation transition is marked by kinematic rotation and cooling
12		during decompression.
13	•	Metamorphic geochronology indicates syn-subduction exhumation occurred continu-
14		ously in an Eocene-Oligocene subduction channel.

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#### 15 Abstract

Exhumed high-pressure/low-temperature (HP/LT) metamorphic rocks provide insights 16 into deep ( $\sim 20-70$  km) subduction interface dynamics. On Syros Island (Cyclades, Greece), 17 the Cycladic Blueschist Unit (CBU) preserves blueschist-to-eclogite facies oceanic- and 18 continental-affinity rocks that record the structural and thermal evolution associated with 19 Eocene subduction. Despite decades of research, the pressure-temperature- deformation 20 history (P-T-D) and timing of subduction and exhumation are matters of ongoing discus-21 sion. Here we show that the CBU on Syros comprises three coherent tectonic slices, and 22 23 each one underwent subduction, underplating, and syn-subduction return flow along similar P-T trajectories, but at progressively younger times. Subduction and return flow are 24 distinguished by stretching lineations and ductile fold axis orientations: top-to-the-S-SW 25 (prograde-to-peak subduction), top-to-the-NE (blueschist facies exhumation), and then E-26 W coaxial stretching (greenschist facies exhumation). Amphibole chemical zonations record 27 cooling during decompression, indicating return flow along the top of a cold subducting 28 slab. New multi-mineral Rb-Sr isochrons and compiled metamorphic geochronology suggest 20 that three nappes record distinct stages of peak subduction (53-52 Ma,  $\sim$ 50 Ma (?), and 30 47-45 Ma) that young with structural depth. Retrograde blueschist and greenschist facies 31 fabrics span  $\sim$ 50-40 Ma and  $\sim$ 43-20 Ma, respectively, and also young with structural depth. 32 The datasets support a revised tectonic framework for the CBU, involving subduction of 33 structurally distinct nappes and simultaneous return flow of previously accreted tectonic 34 slices in the subduction channel shear zone. Distributed, ductile, dominantly coaxial return 35 flow in an Eocene-Oligocene subduction channel proceeded at rates of  $\sim 1.5-5$  mm/yr, and 36 accommodated  $\sim 80\%$  of the total exhumation of this HP/LT complex. 37

#### 38 1 Introduction

The mechanical and thermal properties of the subduction interface strongly influence 39 the internal structure, kinematics, and dynamics of a subduction zone (e.g., Agard et al., 40 2018; Cloos, 1982; Gerya & Stöckhert, 2002). Along the shallow interface ( $\leq 20$  km), 41 direct observations of the megathrust and accretionary wedge are possible through high-42 resolution seismic reflection imaging, ocean bottom seismometers, and ocean drilling projects 43 (e.g., Fagereng et al., 2019; H. Kimura et al., 2010; Park et al., 2002). However, seismic 44 tomography and earthquake seismology have limited spatial and temporal resolution (e.g., 45 Calvert et al., 2011; Rondenay et al., 2008) so the geometry and internal structure of the 46 deep interface ( $\sim 20-70+$  km) remain poorly understood (Agard et al., 2018; Chemenda et 47 al., 1995; Gerya & Stöckhert, 2002; Platt, 1993). 48

The deep interface can be studied through geologic observations of exhumed high-49 pressure/low-temperature (HP/LT) metamorphic rocks. Some of the most spectacular ex-50 amples – e.g., the Franciscan Complex (e.g., Cloos, 1986; Wakabayashi, 1990), Japan (Aoki 51 et al., 2008; G. Kimura et al., 2012), and the Mediterranean region (e.g., Brun & Faccenna, 52 2008; Jolivet et al., 2003; Platt et al., 1998) – have profoundly shaped our understanding of 53 subduction and exhumation processes. Specifically, field studies provide constraints on the 54 structural and kinematic evolution, interface geometry, metamorphic pressure-temperature 55 (P-T) trajectories, and timing and rates of subduction and exhumation (e.g., Agard et al., 56 2018; Angiboust et al., 2016; Behr & Platt, 2012; Dragovic et al., 2015; Platt et al., 2018; 57 Ukar et al., 2012; Xia & Platt, 2017). Geologic observations can validate or challenge the 58 results of geodynamic simulations that model the kinematics and dynamics of rock within 59 plate boundary shear zones (e.g., Cloos, 1982; Gerya & Stöckhert, 2002; Gerya et al., 2002; 60 Warren et al., 2008). 61

Syros Island, located in the central Aegean Sea (Fig. 1), is an ideal locality to study
 deep subduction interface processes due to its exceptional preservation and exposure of
 HP/LT blueschist-to-eclogite facies assemblages (Dürr et al., 1978; Okrusch & Bröcker, 1990;
 Ridley, 1982, 1984). Despite decades of research on Syros, there are many disagreements

regarding the structural evolution, metamorphic conditions, and timing and mechanisms of 66 subduction and exhumation on the island (e.g., Aravadinou & Xypolias, 2017; Bröcker et 67 al., 2013; Keiter et al., 2004; Laurent et al., 2016, 2018; Lister & Forster, 2016; Ridley, 68 1982; Ring & Layer, 2003; Rosenbaum et al., 2002; Schumacher et al., 2008; Skelton et al., 69 2019; Soukis & Stockli, 2013; Trotet, Jolivet, & Vidal, 2001). Furthermore, crustal-scale 70 extensional detachments that accommodated the latest stages of post-orogenic exhumation 71 are well-documented across the Cyclades (Avigad & Garfunkel, 1989, 1991; Gautier et al., 72 1993; Grasemann et al., 2012; Jolivet et al., 2010; Jolivet & Brun, 2010; Schneider et al., 73 2018; Soukis & Stockli, 2013), but workers still debate the relative importance of major 74 detachments during syn-orogenic exhumation from peak conditions, and whether strain was 75 distributed or highly localized on Syros (Bond et al., 2007; Keiter et al., 2004; Laurent et 76 al., 2016; Lister & Forster, 2016; Rosenbaum et al., 2002). 77

In this work, we present new structural and petrologic data and Rb-Sr geochronology, and integrate our results with a synthesis of previously published geochronology, to present a new model for the evolution of the CBU on Syros. Our results refine the island's deformation-metamorphism history, and shed light on the kinematics, metamorphic conditions, and timing of subduction and return flow in the Hellenic subduction zone. This work has implications for rates and mechanisms of HP/LT rock exhumation, and provides a broader framework for regional construction of the Attic-Cycladic Complex.

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#### 2 Regional Geologic Setting

The Cycladic Islands and parts of mainland Greece are part of the Attic-Cycladic 86 Complex (ACC), which is divided into three units according to depositional age and meta-87 morphic history. From structural top to bottom, the units are: (1) the Upper Cycladic 88 Nappe; (2) the Cycladic Blueschist Unit; and (3) the Basal Unit (e.g., Altherr et al., 1994; 89 Avigad & Garfunkel, 1989; Dürr et al., 1978; Jacobshagen, 1986; van der Maar & Jansen, 90 1983) (Fig. 1). The Upper Cycladic Nappe is a suite of ophiolitic slivers, altered carbon-91 ates  $\pm$  serpentinites, Late Cretaceous (70-100 Ma) amphibolite-facies orthogneisses, and 92 Miocene greenschist-facies meta-basalts, and correlates with the Pelagonian Unit exposed 93 on mainland Greece (Papanikolaou, 1987). The Upper Nappe was the upper plate during 94 Late Cretaceous-Paleogene subduction and crops out above the Cycladic Blueschist Unit 95 (CBU) in the hanging wall of crustal-scale, Miocene detachment faults on several Cycladic 96 Islands (Jolivet et al., 2010, 2013; Soukis & Stockli, 2013). 97

The majority of the ACC is composed of the Cycladic Blueschist Unit (CBU) (Fig. 98 1). The CBU comprises poly-metamorphosed tectonic slices (Dürr et al., 1978; Forster & 99 Lister, 2005, 2008; Jolivet & Brun, 2010) of the following protoliths: (1) (Jurassic?-to-) 100 Cretaceous (~80 Ma) mafic igneous crust with enriched-MORB and back-arc geochemical 101 signatures  $\pm$  serpentinized mantle (Bonneau, 1984; Bulle et al., 2010; Cooperdock et al., 102 2018; Fu et al., 2015; Seck et al., 1996; Tomaschek et al., 2003), (2) Triassic (~240 Ma) 103 bimodal rift volcanics (Bolhar et al., 2017; Keav, 1998; Löwen et al., 2015; Robertson, 104 2007) blanketed by Triassic-to-Cretaceous, locally-sourced, rifted and passive continental 105 margin siliciclastic and carbonate rocks (Löwen et al., 2015; Papanikolaou, 2013; Poulaki 106 et al., 2019; Seman, 2016; Seman et al., 2017), and (3) peri-Gondwanan basement cross-107 cut by Carboniferous calc-alkaline granitoids (Flansburg et al., 2019; Keay, 1998; Keay & 108 Lister, 2002). Regionally, CBU lithologies record evidence for HP/LT metamorphism under 109 blueschist-to-eclogite facies ('M1') conditions between  $\sim$ 53-30 Ma (Cliff et al., 2016; Dixon, 110 1976; Lagos et al., 2007; Laurent et al., 2017; Okrusch & Bröcker, 1990; Ring, Glodny, et 111 al., 2007; Schliestedt, 1986; Tomaschek et al., 2003; J. R. Wijbrans et al., 1990). The CBU 112 was exhumed first within the subduction channel, leading to blueschist and greenschist 113 facies overprinting (e.g. Cliff et al., 2016; Kotowski & Behr, 2019; Laurent et al., 2018; 114 Ring et al., 2020), and then in the footwalls of crustal-scale, low-angle normal faults of 115 the North, West, and South Cycladic (Grasemann et al., 2012; Jolivet et al., 2003, 2010; 116 Jolivet & Brun, 2010; Ring et al., 2003, 2011; Roche et al., 2016; Soukis & Stockli, 2013), the 117



Figure 1: Regional tectonic map of the Cyclades, modified from Grasemann et al. (2012). Syros is outlined by the yellow box. North Cycladic (NCDS), West Cycladic (WCDS), Paros-Naxos (PNDS), and Santorini (SDS) Detachment Systems are outlined in white. Kinematic indicators are from Aravadinou et al. (2016), Forster et al. (2020), Grasemann et al. (2012), Huet et al. (2009) and references therein.

Paros-Naxos (Gautier et al., 1993), and the Santorini Detachment Systems (Schneider et al., 118 2018). Exhumation beneath ductile and semi-brittle detachments led to the development 119 of Metamorphic Core Complexes (MCCs) that locally also produced a greenschist-facies 120 ('M2') overprint (Bröcker, 1990; Bröcker et al., 1993). As slab rollback initiated and the 121 arc migrated southward through the former forearc, Miocene I-type plutons intruded the 122 exhuming CBU, and MCC formation led to a local high-temperature, amphibolite-facies 123 ('M3') overprint on some islands (e.g., Paros and Naxos, Mykonos, and Ikaria) between 124  $\sim$ 21-17 Ma (Andriessen et al., 1979; Brichau et al., 2007; Lister et al., 1984; Pe-Piper et 125 al., 2002; Rabillard et al., 2018; Vanderhaeghe & Whitney, 2004; J. Wijbrans & McDougall, 126 1988). 127

#### <sup>128</sup> 3 The CBU on Syros Island

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### 3.1 Rock types and tectonostratigraphy

Syros is a small island (~84 km<sup>2</sup>) in the central Cyclades and is dominantly composed
of CBU with a klippe of UU in the southeast in the hanging wall of the Oligo-Miocene
Vari Detachment (Ridley, 1984; Ring et al., 2003; Keiter et al., 2011; Soukis & Stockli,
2013) (Fig. 1). In the context of the Cyclades, Syros best preserves the regional HP/LT
metamorphic event (Ridley, 1982; Okrusch & Bröcker, 1990), but similar assemblages are
preserved on the island of Sifnos (Aravadinou et al., 2016; Roche et al., 2016).



Figure 2: Geologic and structural map of Syros Island, modified from Keiter et al. (2004, 2011). Structural elements and locations of the Syringas Marker Horizon are from Keiter et al. (2011). Constraints on protolith ages are from the references discussed in Section 3.1. Protolith ages are color coded according to rock type. Localities discussed in this study are shown in bold italics, new Rb-Sr sample names and locations are in italics.

Within the CBU on Syros, mafic blueschists and eclogites crop out along three tectonos-136 tratigraphic horizons: Kampos Belt, Kini-Vaporia-Kalamisia, and Galissas-Fabrikas. Each 137 horizon exposes  $\sim 300-500$  m (structural thickness) of blueschist-to-eclogite facies meta-138 basalts and gabbros, serpentinites, and bimodal blueschist-quartz schist meta-volcanics in 139 varying proportions. Along Kampos Belt, eclogitic meta-gabbros, blueschist facies bimodal 140 meta-volcanics, and serpentinite/chlorite-talc schists are most abundant (Dixon & Ridley, 141 1987; Keiter et al., 2011; Ridley, 1982) (Fig. 2). Kini, Vaporia (north of Ermoupoli), 142 and Kalamisia are primarily composed of fine-grained mafic blueschist, and contain pods 143 and lenses of eclogite (centimeters-to-decimeters in diameter) and meters-thick layers of 144 serpentinite/talc schist (Keiter et al., 2011; Kotowski & Behr, 2019). Fabrikas comprises 145 coarse-grained glaucophane-bearing eclogites (centimeters to meters in diameter) within a 146 fine-grained matrix of mafic blueschists and quartz-mica schists, capped by meta-carbonate 147 (Kotowski & Behr, 2019; Ring et al., 2020; Skelton et al., 2019). Keiter et al. (2011) 148 suggested that mafic blueschists and eclogites are genetically related, and changes in vol-149 ume proportions of lithologies reflect primary lateral and/or vertical 'facies changes' of an 150 enriched-MORB or back-arc igneous suite. 151

The majority of the CBU comprises a  $\sim$ 6-8 km section of intercalated meta-volcanic 152 and meta-sedimentary schists, and calcite- and dolomite-marbles with Jurassic-to-Cretaceous 153 depositional ages (Keiter et al., 2004; Löwen et al., 2015; Papanikolaou, 2013; Seman et al., 154 2017) (Fig. 2). Keiter et al. (2004, 2011) documented a series of boudinaged marbles, 155 cherts, and albite-bearing quartiete, which they named the Syringas Marker Horizon (or-156 ange dots on Fig. 2). The sequence crops out at 3 or 4 different structural levels suggesting 157 it marks several km-scale thrust sheets and may reflect relict primary sedimentary layering 158 (Dixon & Ridley, 1987; Keiter et al., 2011; Ridley, 1982). Repetition of the Syringas Marker 159 Horizon by km-scale folding is unlikely because the largest observable upright folds within 160 this sequence have amplitudes of several hundreds of meters and the marker horizon never 161 appears to be overturned (Keiter et al., 2011). Furthermore, Keiter et al. (2011) docu-162 mented repetition of distinct packages of bimodal, rift-related meta-volcanics (also mapped 163 as "banded tuffitic schists") that have Triassic magmatic protolith ages (Keay, 1998; Löwen 164 et al., 2015; Pe-Piper et al., 2002; Seman, 2016) (Fig. 2), and Seman (2016) presented detri-165 tal zircon (DZ) Maximum Depositional Ages (MDA) for meta-sedimentary rocks that reveal 166 young-on-old tectonostratigraphic inversions; both results appear to support imbrication. 167

#### 3.2 Previously proposed P-T-D-t paths

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Previously published P-T-D evolutions for Syros fall into two categories. Some work-169 ers have argued that the majority of deformation and metamorphism on the island is 170 exhumation-related (Laurent et al., 2016; Lister & Forster, 2016; Trotet, Jolivet, & Vi-171 dal, 2001) (Fig. 3A). These studies interpret mafic blueschists and eclogites to occupy the 172 top of the structural pile and separate them from underlying meta-sedimentary rocks along 173 extensional shear zones (Forster & Lister, 2005; Laurent et al., 2016, 2018; Trotet, Vidal, 174 & Jolivet, 2001). An implication of this model is that distinct rock types were juxtaposed 175 during syn-orogenic exhumation (Forster & Lister, 2005; Laurent et al., 2016). Fresh and 176 retrogressed eclogite has been documented throughout the structural pile on Syros, which 177 is considered evidence that all rocks reached high-pressure conditions during subduction. 178 However, lithologic packages that currently occupy different structural depths could have 179 followed different P-T paths during exhumation (cf. Laurent et al., 2018; Trotet, Vidal, 180 & Jolivet, 2001; Trotet, Jolivet, & Vidal, 2001), and/or could have been subducted at dif-181 ferent times (Laurent et al., 2017; Lister & Forster, 2016). This model could potentially 182 explain reported differences in P-T estimates across Syros; mafic blueschists and eclogites 183 184 may have been subducted slightly deeper, earlier, compared to meta-sedimentary lithologies (as discussed by Schumacher et al. (2008)). 185

Alternatively, other work has suggested that prograde deformation and metamorphism on the island are locally preserved, and exhumation-related strain was partitioned into



Figure 3: (A) Compilation of proposed P-T-D histories for the CBU on Syros. (B) Closure temperature vs. time for compiled metamorphic geochronology listed in Table A2. This dataset comprises 100 datapoints made up of 185 individual ages (some data clusters are weighted means), from 16 studies and 5 chronometers, from work published during the interval 1987-2019. The black bar at the bottom labeled 'structural development' shows that the timing and tectonic significance of progressive Eo-Oligocene deformation events (see also D1-D4 in panel A) and corresponding fabric development is contentious.

weaker lithologies (Bond et al., 2007; Cisneros et al., in press; Keiter et al., 2004, 2011; 188 Ridley, 1982; Rosenbaum et al., 2002) (Fig. 3A). These studies interpret mafic blueschist 189 and eclogites to record primary relationships with surrounding schists and marbles, or to 190 have been juxtaposed with the schists and marbles during early thrusting (Blake Jr et 191 al., 1981; Hecht, 1985; Keiter et al., 2004; Ridley, 1982). For either of those cases, map-192 scale lenses of mafic blueschists and eclogites at Vaporia, Kalamisia, and Fabrikas need 193 not be separated from surrounding CBU by faults or shear zones (i.e., the structurally 194 highest Kampos sub-unit of Laurent et al. (2016)), but instead could occupy a range of 195 structural depths throughout the tectonostratigraphic pile (Keiter et al., 2004). This model 196 implies that meta-mafic and meta-sedimentary rocks that occupy similar structural levels 197 were subducted together and experienced similar P-T histories through subduction and 198 exhumation (Cisneros et al., in press; Keiter et al., 2011; Schumacher et al., 2008). 199

Although existing metamorphic ages help to roughly distinguish prograde from retro-200 grade fabrics, and the timing of subduction vs. exhumation, clearly differentiating between 201 these P-T-D evolutions has been challenging because of the difficulty in assigning geologic 202 significance to ages (Fig. 3B). Two age clusters are commonly cited for the timing of peak 203 subduction on Syros: ~53-50 Ma (U-Pb zircon, Ar/Ar and Rb-Sr white mica, Lu-Hf garnet; 204 Cliff et al. (2016); Lagos et al. (2007); Lister and Forster (2016); Tomaschek et al. (2003)), 205 and both  $\sim 52$  Ma and  $\sim 45$  Ma for different underplated slices (Ar/Ar white mica; Forster 206 and Lister (2005); Laurent et al. (2017); Lister and Forster (2016)). Garnet Sm-Nd and 207 Lu-Hf ages span the proposed range, thus raising the question of whether garnet growth 208 reflects two pulses or continuous growth at peak conditions (cf. Kendall, 2016). Further-209 more, Ar/Ar and Rb-Sr ages span the entire Eocene. Maximum CBU temperatures do not 210 appear to have exceeded those required for diffusional resetting of the Ar/Ar and Rb-Sr sys-211 tems, therefore it is unclear whether retrograde blueschist-to-greenschist facies white mica 212 ages record incomplete isotopic mixing, and/or partial or continuous recrystallization dur-213 ing exhumation, beneath the isotopic closure temperature of the Ar/Ar and Rb-Sr systems 214 (Fig. 3B) (e.g., Bröcker et al., 2013; Cliff et al., 2016; Laurent et al., 2017; Rogowitz et 215 al., 2014; Uunk et al., 2018). An additional challenge is that many geochronologic data 216 points in Figure 3B were collected without a clear framework for linking the ages to specific 217 fabric-forming events. 218

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#### 4 Approach and Methodology

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#### 4.1 Structural and Microstructural Analysis

Following detailed mapping by Keiter et al. (2004, 2011) (map in Figure 2 and 4), 221 we collected new structural data at several localities from Northern Syros (Fig. 4A-C), 222 Central Syros (Fig. 4D-H), and Southeastern Syros (Fig. 4I-K). Planar and linear structural 223 elements were measured, including foliations and cleavages, axial planes to folds, fold axes, 224 and mineral growth, crenulation and stretching lineations. We constructed  $\pi$  circle diagrams 225 to constrain fold orientations by plotting poles to metamorphic foliation planes. Each color 226 on a given stereonet in Figure 4 corresponds to poles to foliations of a specific rock type, 227 or poles to foliations defining single outcrop-scale folds (e.g. Fig. 5I,K). Our measurements 228 used to produce  $\pi$  diagrams were all derived from cylindrical structures; even if folds have 229 curved hinge lines on larger scales, we measured folds in locations where hinge lines are 230 locally straight. We calculated poles to mean circles to determine fold axis orientations 231 (bold circles), and compared them to fold axes that could be directly measured (diamonds) 232 and mineral lineations (open circles). We documented minerals defining lineations and 233 fold axes, porphyroblast stability and kinematic context (i.e., pre-, syn, post-kinematic 234 with respect to surrounding fabric), and break-down and replacement textures (Fig. 5) to 235 constrain metamorphic conditions of deformation. Microstructural analysis (Fig. 6) (139 236 total samples, 21 studied in detail) and quantitative EPMA analyses of zoned minerals (6 237 samples) further refined P-T-D conditions (Figs. 7, 8). 238

#### 4.2 Rb-Sr Geochronology

We selected five samples for multi-mineral Rb-Sr geochronology. This technique has 240 been applied to exhumed HP/LT metamorphic rocks to date deformation and metamorphism 241 with great success (Angiboust et al., 2016; Cliff et al., 2016; Freeman et al., 1997; Glodny 242 et al., 2005, 2008; Kirchner et al., 2016; Ring, Will, et al., 2007). The primary assumption 243 required to construct a multi-mineral isochron is that the phases defining the isochron were 244 co-genetic, such that they all inherited the same initial Sr composition. We separated 245 and picked minerals that we hypothesized were co-genetic based on our structural and 246 microstructural results, and quantitatively tested this hypothesis by identifying phases that 247 were in isotopic disequilibrium (i.e., fell off the isochron) (Cliff & Meffan-Main, 2003). Strong 248 foliations support the assumption of syn-kinematic recrystallization of selected minerals, 249 which can reset the Sr isotopic signature between mica and co-genetic phases to temperatures 250 as low as 300°C (Müller et al., 2000). Furthermore, diffusional resetting of the Rb-Sr 251 system is thought to begin at  $\sim$ 550-600°C (Glodny et al., 2008; Inger & Cliff, 1994), which 252 exceeds maximum temperatures in the CBU. Therefore, we interpret our Rb-Sr ages as 253 (re-)crystallization ages associated with deformation. 254

Following Glodny et al. (2003, 2008), we used a bulk mineral separation technique and 255 cut out  $\sim 5 \text{ cm}^3$  cubes of rock from hand samples to isolate specific fabrics corresponding to 256 different stages of the deformation history recorded on Syros. Samples were crushed with 257 a small hammer between sheets of paper, ground gently with a rock crusher, and sieved 258 and separated by grain size. Grain size fractions 125-250  $\mu$ m and 250-500  $\mu$ m were frantzed 259 to separate minerals based on magnetic susceptibility. Mineral separates were picked by 260 hand under a microscope, and white mica separates were cleaned of inclusions by gently 261 smearing them in a mortar and pestle and washing them through a sieve with ethanol. All 262 Rb and Sr isotopic separation and analyses were done at the University of Texas at Austin 263 in the Radiogenic Isotopic Clean Lab. All separates (except apatite) were cleaned in 2 N 264 HCl to remove surficial contamination and spiked with mixed high Rb/Sr and low Rb/Sr 265 spikes. We followed methodology for mineral dissolution, isotope column chemistry, Thermal Ionization Mass Spectrometry (Sr analyses), Solution Inductively Coupled Plasma Mass 267 Spectrometry (Rb analyses), and estimating uncertainties in isotopic ratios as described 268 in Kirchner et al. (2016). Reproducibility on replicate USGS Standard Hawaiian Basalt 269 (BHVO) Rb measurements determine the uncertainty of the Rb-Sr ratio, and long-term 270 reproducibility on the NBS987 Sr standard determines the uncertainty of the Sr ratio (Table 271 2). Ages were calculated using the IsoplotR toolbox (Vermeesch, 2018) with the <sup>87</sup>Rb decay 272 constant of  $1.3972 \pm 0.0045 \ge 10^{-11}$  year <sup>-1</sup> (Villa et al., 2015). 273

#### <sup>274</sup> 5 Structures and Deformation Fabrics

The CBU on Syros records evidence for three main phases of deformation and meta-275 morphism, herein referred to as  $D_R$ ,  $D_S$ , and  $D_{T1-2}$  (Table 1). Subscripts follow an alpha-276 betical order according to the relative age of deformation, i.e.,  $D_R$  is the oldest observed 277 deformation, and  $D_{T1-2}$  is the youngest. Each phase led to spaced to penetrative foliation 278 development, and/or ductile folding of older foliations. Kinematic indicators, metamorphic 279 mineral assemblages, and porphyroblast zonations described herein demonstrate that  $D_R$ 280 and  $D_S$  developed on the prograde path and are best preserved in mafic blueschists and 281 eclogites (but are locally preserved as textural relicts in bimodal meta-volcanics and meta-282 sediments), and  $D_T$  developed on the retrograde path and is best recorded by meta-volcanic 283 and meta-sedimentary schists. 284

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### 5.1 $D_R$ – Prograde fabric development during subduction under blueschist facies conditions

 $D_R$  is the earliest recognizable prograde event but it is not visible at the outcrop-scale.  $D_R$  likely formed a strong, penetrative  $S_R$  foliation that is locally recorded as inclusion trails

Event	Context	Diagnostic Structures		Metamorphism	<b>Example Localities</b>
Dr	Subduction	Only preserved as inclusion trails in garnets and as early fabric (SR) that is tightly folded during Ds	SR mm	lawsonite-blueschist	N/A
Ds	Subduction to near-peak P-T conditions	<ul> <li>Axial plane schistosity (Ss) associated with tight to isoclinal folds (Fs) that transpose the SR foliation, with S-SW-plunging fold axes</li> <li>S-SW mineral and stretching lineations</li> <li>Dominantly non-coaxial with top-S-SW sense of shear, locally non-penetrative in mafic lenses (e.g. Grizzas)</li> </ul>	State of the state	lawsonite blueschist- to-eclogite	Grizzas Kini
DT1-2	Exhumation	<ul> <li>Crenulation cleavage (ST) associated with upright, opento-tight folds (FT) that fold Ss</li> <li>Ss foliation continuously reworked and retrogressed</li> <li>Fold axes and mineral lineations rotate from N-NE (DT1) to E-W (DT2) as a function of strain</li> <li>Dominantly coaxial, but locally non-coaxial (e.g. near the Vari Detachment at Fabrikas, Kalamisia)</li> <li>Ductile to semi-brittle boudinage in later stages</li> </ul>	ST I S S M	epidote-blueschist progressing to greenschist	Kampos (early) Azolimnos (early) Delfini (later) Lotos (later)

Table 1: Summary of interpreted deformation-metamorphism events in the CBU on Syros.

in garnet porphyroblasts at Kampos (Fig. 6A,B) and is tightly folded during  $D_S$ . Inclusion trails are orthogonal to the external foliation and are defined by glaucophane, omphacite, and white mica.

#### 5.2

### 5.2 $D_S$ – Prograde-to-peak fabric development during subduction under blueschist to eclogite facies conditions

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#### 5.2.1 $D_S$ Structures

 $D_S$  is best recorded at Grizzas and Kini (Fig. 4E), with relicts preserved on Kampos 295 Belt (Fig. 4C), at Lia Beach, and at Azolimnos (Fig. 4J).  $D_S$  produced a dominant  $S_S$ 296 foliation in mafic blueschists, meta-cherts, and bimodal meta-volcanics at Grizzas that is 297 parallel to the axial planes of intrafolial folds  $(F_S)$ , and rotated and boudinaged quartz 298 veins. This folding event is characterized by shallowly to moderately plunging SW-trending 299 fold axes clustering around 205-251°/15-35°; glaucophane mineral lineations are similarly 300 oriented (Fig. 4B). In rare cases, outcrop-scale prograde metamorphism was not associated 301 with penetrative deformation, indicated by preservation of igneous protolith features such as 302 pillow lavas (Grizzas, cf. Keiter et al. (2011)), intrusive relationships (Kini, cf. Kotowski and 303 Behr (2019) and Laurent et al. (2016)), and magmatic breccias (e.g., at Grizzas, Episkopi, 304 Fig. 5A). 305

Kini dominantly records  $D_S$  deformation-metamorphism; it is bounded by high-angle 306 normal faults and is structurally discordant with respect to the surrounding CBU (Fig. 4E; 307 cf. Keiter et al. (2011)). In one location, serpentinite wraps around the base of massive meta-308 gabbros, which transitions upward into fine-grained blueschists, suggesting local preservation 309 of an attenuated section of metamorphosed oceanic lithosphere (Fig. 5B). Similar to Grizzas, 310 the  $D_S$  fabric in Kini blueschists contains isoclinal folds ( $F_S$ ) with shallowly south-plunging 311 fold axes. This fold generation is recorded by a  $182^{\circ}/33^{\circ}$  fold axis in Kini schists (Fig. 4E; 312 Fig. 5D). The S<sub>S</sub> axial planar cleavage seen in Kini mafic blueschists (e.g., Fig. 5C,D) is also 313 seen as textural relicts in quartz-mica rich lithologies, as at Azolimnos (Fig. 5G). In some 314 localities, blue amphibole lineations define great circles, likely reflecting folding of earlier 315



Figure 4: Geology and structural elements of Northern Syros. Base map, foliation orientations, and fold axes (black arrows) are from Keiter et al. (2011). Black fold axes are Keiter et al. (2011)'s intrafolial 'F2 shear folds.' The spread of orientations is the result of superposed folding, as older folds were progressively reoriented by S-vergent simple shear folding during prograde subduction (cf. Keiter et al., 2004). Foliations are plotted as poles (unless otherwise specified), and colored best-fit planes are  $\pi$  circles. Topographic contours are 20 m. New data plotted in stereonets were collected from the areas outlined by solid black boxes. Cross section A1-A2-A3 is modified from Keiter et al. (2011). See text for description of structural elements.



Figure 4: Continued. Geology and structural elements of Central Syros. See Fig. 2 for the cross section corresponding to the line shown.



Figure 4: Continued. Geology and structural elements of Southeast Syros. Black arrows with the circles are upright fold axes in the Vari Unit. Cross section B1-B2-B3 is modified from Keiter et al. (2011); compare with Laurent et al. (2016).



Figure 5: (Previous page.) Selected field photos showing prograde (A-D) and retrograde (E-L) deformation and metamorphism. (A) Preservation of primary igneous breccias at Grizzas. (B) Right-side-up sequence of oceanic lithosphere at Kini. (C, D)  $S_S$  at Kini contains lawsonite pseudomorphs and omphacite with glaucophane- and garnet-filled pressure shadows. Black arrows in the close-up photo of (C) point to pseudomorphs with garnet inclusions. (E)  $D_{T1}$  retrogression under blueschist-facies conditions is marked by local static glaucophane coronas formed around pinched eclogite lenses at Vaporia. (F) Coaxial E-W stretching of calcite clasts in meta-conglomerate at Delfini during  $D_{T1-2}$ . (G,H)  $S_S$  is cut by  $S_{T1}$  crenulation cleavage at Azolimnos. (H) Two glaucophane lineations record transposition of  $S_S$  (black arrow, parallel to pen) into alignment with crenulation hinges (white arrow) during  $D_{T1}$ . (I-K)  $D_{T2}$  greenschist facies retrogression and upright folding at Delfini (I) and Lotos (K). (I) White arrows point to  $F_S$  folds along the limbs of  $F_T$  fold. Dashed white lines mark the axial planar  $S_T$  cleavage. (J) Non-coaxial, top-to-the-E extensional shear under retrograde blueschist-to-greenschist facies conditions at Fabrikas. (K)  $S_S$  cross-cut by  $D_T$  folding; fold axes trend E-W. (L) Coaxial, lineation-parallel  $D_{T2}$  brittle boudinage of epidote-rich lenses in greenschists.

 $(D_R)$  fabric during  $D_S$  (Fig. 4C, 4E; relicts at Azolimnos in Fig. 4J). In other localities, blue amphibole lineations appear to be reoriented into moderately S- or SW-plunging clusters (e.g., Grizzas and Kini, Fig. 4B,E). Similarly, Keiter et al. (2004, 2011) documented a significant spread of fold axis orientations which they attributed to superposed folding that systematically reoriented older fold hinges via S-vergent simple shear during prograde-topeak subduction (i.e. their  $D_2$ , black fold axes in Fig. 4).

Locally, centimeter-sized, prismatic pseudomorphs after lawsonite indicate that lawsonite grew at the culmination of  $D_S$  but did not survive peak conditions. Syn-to-postkinematic porphyroblasts overgrow the mafic blueschist foliation at Grizzas and Lia, decorate foliation-parallel compositional layers at Kini (Fig. 5C), and commonly contain inclusions of garnet, and are included by garnet (Fig. 5C, closeup). Pseudomorphs are weakly attenuated along the limbs of folds, but preserve their diamond-like shapes in fold hinges (Fig. 5C).

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#### 5.2.2 $D_S$ Microstructures and Mineral Chemistry

<sup>330</sup>  $D_S$  micro-textures in meta-sedimentary rocks are characterized by strong quartz-mica <sup>331</sup> cleavage-microlithon  $S_S$  fabrics and rotated inclusion trails in garnets that are mostly con-<sup>332</sup> tinuous with external foliations (Fig. 6C). Quartz-rich microlithons have strong lineation-<sup>333</sup> parallel shape-preferred orientations, and mica-rich cleavages comprise intergrown phengite <sup>334</sup> and paragonite (Fig. 6C, Fig. 7C). Lawsonite pseudomorphs preserved as inclusions in <sup>335</sup> garnet comprise intergrown epidote and white mica (Fig. 6D).

 $D_S$  micro-textures in mafic blueschists are characterized by compositional segregation 336 defined by glaucophane-rich and epidote-rich layering alternating on the mm-scale ( $\sim$ 50-200 337  $\mu$ m grain size) (Fig. 6E). The S<sub>S</sub> foliation contains syn-kinematic porphyroblasts of garnet 338 and omphacite ( $\sim 300 \ \mu\text{m-5 mm}$ ), and rutile with minor titanite overgrowths (Figs. 6F, 339 7A). Syn-kinematic phengitic white mica is chemically homogeneous and has 3.35-3.45 Si 340 atoms p.f.u. (Fig. B1). Omphacite and garnet deflect local foliations, and have pressure 341 shadows and strain caps composed of glaucophane, phengite and paragonite, and/or more 342 omphacite (Fig. 5D, 7A). Omphacite porphyroblasts in Kini blueschists have cores of low-343 Na, high-Mg omphacite, fringed by asymmetric, syn-kinematic pressure shadows of high-344 Na, low-Mg omphacite (Fig. 7A). D<sub>S</sub> amphibole is glaucophane (Figs. 7A, 8A). Rare 345





Figure 6: (Previous page.) Selected photomicrographs showing prograde (A-F) and retrograde (E, G-K) deformation and metamorphism. (A,B) Internal  $S_R$  inclusion trails from Lia Beach (A, PPL; B, XPL). (C)  $S_S$  contains syn-kinematic garnet porphyroblasts with foamy quartz inclusion trails that are rotated but continuous with respect to the dominant external  $S_S$  foliation. (D)  $D_S$  garnets include pseudomorphs after lawsonite (comprising epidote and white mica). (E, F)  $S_S$  in mafic blueschists. (E)  $S_S$  is cut by  $D_{T1}$  crenulation under glaucophane-stable conditions in mafic blueschists. (F) Omphacite and garnet in  $D_S$  Kini blueschists have asymmetric pressure shadows filled with high-pressure minerals. (G-I)  $D_{T1}$  retrogression in bimodal meta-volcanics at Kampos (H), Azolimnos (H) and Kalamisia (I). (H)  $D_{T2}$  crenulation transposes  $S_S$ , and strengthens as albite, chlorite, and actinolite stabilize. (I) Omphacite and paragonite break down to epidote, blue amphibole, and albite. (J,K)  $D_{T2}$  in Lotos greenschists. (J) Brittle micro-boudinage of epidote porphyroblasts. (K) Final stages of  $D_{T2}$  are characterized by post-tectonic albite growth.

examples reveal glaucophane cores with thin, patchy rims (Fig. 7B) that trend towards lower  $Al^{iv}/(Al^{iv}+Fe_{tot})$  values and higher  $(Na+K)_A$  (Fig. 8A, Fig. B1).

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### 5.3 $D_T$ – Retrograde fabric development, crenulation, and re-folding through blueschist-to-greenschist facies conditions

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5.3.1  $D_T$  Structures

 $D_{T1}$  is best recorded at Kampos Belt and Palos (Fig. 4A,C), Azolimnos (Fig. 4J), 351 and Kalamisia (Fig. 4I), and locally at Kini (Fig. 4E).  $D_{T1}$  structures refold older  $S_S$  foli-352 ations into inclined-to-upright, open-to-tight, shallowly to moderately N- and NE-plunging 353 folds (Fig. 4C, 4G,H, 4I,J; C1). Glaucophane, calcite, and quartz mineral and stretching 354 lineations are oriented parallel to  $F_T$  fold hinge lines (Fig. 4C,I,J). Along Kampos Belt, 355  $D_{T1}$  fold axes span ~335-055°/15-45°, with a cluster of moderately N-plunging folds (e.g., 356 Fig. 4C). At Azolimnos,  $D_{T1}$  folding locally develops an upright crenulation cleavange  $(S_T)$ 357 that cuts the  $S_S$  foliation (Fig. 4I,J; 5G). Cm-scale spaced cleavages are parasitic to larger 358 open folds with  $045^{\circ}/5$ - $10^{\circ}$  fold axes and steep axial planes. At Azolimnos, glaucophane 359 lineations define a great circle and swing from N to NE into alignment with  $F_{T1}$  crenulation 360 hinge lines (Fig. 5H). Crenulation of Kini rocks is defined by a vertical, NE-striking  $S_{T1}$ 361 cleavage that cross-cuts mafic blueschists (Fig. 4E). 362

 $D_{T2}$  is characterized by E-W orientated mineral and stretching lineations that are pri-363 marily indicative of greenschist facies conditions (e.g., Lotos, Delfini; Fig. 4D,F) but locally 364 preserve blueschist facies conditions where strain was highly non-coaxial (i.e., Fabrikas; Figs. 365 4K, 5J), and can be seen in a wide range of rock types throughout central and southern Sy-366 ros. At Vaporia, the mafic blueschists and eclogites and the surrounding meta-sedimentary 367 rocks develop identical  $D_{T2}$  structures (Fig. 4G,H). Single greenschist facies  $F_{T2}$  folds range 368 in geometry from open to tight and have near-vertical, E-NE- to E-W striking axial planes. 369  $F_{T2}$  fold axes cluster strongly around ~070-110°/5-30° (Figs. 4D,F; 5I,K), and mineral 370 and stretching lineations defined by actinolite, quartz, calcite, and relict glaucophane are 371 oriented parallel to  $F_{T2}$  hinge lines (Fig. 4 D,F,H). Older  $S_S$  foliations are progressively 372 reworked during  $D_{T2}$  creating a composite retrogressed foliation which is visible as S- and 373 Z-folds (e.g., Fig. 5I,K) with hinge-limb layer thickness variations locally exceeding 20:1 374 (Fig. C1).  $F_{T2}$  folds have axial planar cleavages decorated with actinolite, epidote, and 375 chlorite. Coaxial stretching parallel to  $F_{T2}$  fold hinges is common, resulting in semi-brittle 376 to brittle boudinage of epidote-rich lenses visible from the meso- to the micro-scale, as 377 competent lithologies become brittle during exhumation (Fig. 5L). At Delfini, shear sense 378 clast counting of a carbonate meta-conglomerate (GPS: 37°27'36" N/024°53'46" E) reveals 379



Figure 7: False-colored X-Ray maps and representative BSE images of  $D_S$  in Kini blueschists (A,B) and Azolimnos bimodal meta-volcanics (C,D),  $D_{T1}$  in Kalamisia blueschists (E,F), and  $D_{T2}$  in Fabrikas quartz-mica schists (G,H). Quantitative analyses of sodic amphiboles in (B, KCS53) and (F, KCS12B) are shown in Fig. 8; white mica analyses from (H, KCS65) are shown in Fig. B1.



Figure 8: Amphibole mineral chemistry and micro-textures. (A) Quantitative amphibole EPMA analyses (Leake et al. (1997) classification scheme). All analyses have  $Na_B > 1.5$  apfu except for those indicated with an asterisk. (B)  $D_{T1}$  static growth zonations in glaucophane contained in retrogressed eclogite pod. (C)  $D_{T1}$  lineation-parallel zonations developed in glaucophane-filled strain shadow fringing garnet porphyroclasts. (D) Greenschists preserve relict  $D_{T1}$  sodic amphibole as inclusions in epidote, and matrix amphibole records lineation-parallel compositional changes during  $D_{T2}$  retrogression.

conflicting and/or ambiguous shear sense. This is indicative of dominantly coaxial strain during reworking of a composite foliation that develops syn-kinematically with respect to upright folding (cf. Supplemental Fig. C1).

Pulses of  $D_T$  metamorphism that are not associated with penetrative strain are seen 383 at Vaporia where pinched eclogite pods are rimmed by roughly even-thickness inky blue 384 coronas of glaucophane (Fig. 5E), and along Kampos Belt where the margins of meta-385 gabbros develop radiating clusters of blue and green amphibole needles (Fig. C1). Although 386  $D_T$  strain is primarily coaxial, strongly asymmetric strain occurs locally on the E-SE side 387 of the island. Non-coaxial  $D_{T1-2}$  is best preserved at Kalamisia and Fabrikas, respectively. 388 At Fabrikas for example, outcrop-scale extensional shear bands and boudinage cross-cut 389 eclogite pods and are decorated by glaucophane (partially replaced by actinolite) and quartz 390 (Kotowski & Behr, 2019; Laurent et al., 2016). 391

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#### 5.3.2 D<sub>T</sub> Microstructures and Mineral Chemistry

 $D_{T1}$  microstructures transpose and retrogress older  $S_S$  foliations, record geochemical 393 evidence for retrogression through primarily blueschist facies conditions, and are primarily 394 coaxial. Crenulation hinges that record  $D_{T1}$  in mafic blueschists are defined by high-Si 395 white mica and glaucophane that has an identical composition to glaucophane defining the 396  $S_S$  foliation (Lia Beach, Fig. 6E; Fig. B1). Coaxial  $D_{T1}$  deformation in mafic blueschists is 397 evidenced by symmetric strain shadows around partially chloritized garnets. During  $D_{T1}$ , 398  $S_{S}$ -defining blue amphibole grows in the symmetric strain shadows and records lineation-399 parallel growth zonations trending from glaucophane to magnesio-riebeckite (Vaporia, Fig. 400 8A,C) and locally becomes actinolitic (e.g., Kampos, Fig. 6G). Some static textures record 401 the same compositional trend (e.g., Fig. 8A,B). At Kalamisia, extensional C-C' fabrics are 402 well-developed in thin section, and C' top-to-the-ENE shear bands are decorated with albite, 403 paragonite, and phengite (Fig. 7E,F). C' cleavages are also defined by finely recrystallized 404 blue amphibole that records lineation-parallel core-to-rim zonations from high-Al riebeckite 405 to low-Al (and lower  $(Na+K)_A$ ) riebeckite (Figs. 6I, 7F, 8A). Omphacite and paragonite 406 porphyroblasts record the breakdown reaction  $omphacite + paragonite + H_2O = sodic am-$ 407 phibole + epidote + albite (Fig. 6I), and rutile is overgrown by syn-kinematic titanite (Figs. 408 7E). In quartz-mica schists, the retrogressed  $S_S$  foliation comprises alternating glaucophane-409 rich and quartz-mica  $\pm$  albite-calcite layering; the syn-D<sub>T1</sub> axial planar cleavage, S<sub>T1</sub>, is 410 defined by actinolite, albite, phengite and paragonite in the cores of upright  $F_{T1}$  folds (Fig. 411 6H). 412

 $D_{T2}$  microstructures transpose and retrogress older  $S_S$  foliations, and are primarily 413 coaxial and record geochemical evidence for retrogression under greenschist facies condi-414 tions (e.g., Delfini and Lotos). Locally  $D_{T2}$  was non-coaxial and developed under blueschist 415 facies conditions (e.g., Fabrikas). Mafic greenschists that record  $D_{T2}$  comprise strongly 416 retrogressed  $S_S$  foliations that are defined by fine-grained white mica, albite, epidote, acti-417 nolite, chlorite, calcite, and titanite ( $\sim$ 50-500  $\mu$ m grain size), and contain lineation-parallel 418 epidote porphyroblasts ( $\sim$ 2-5 mm) and unoriented, mat-like albite porphyroblasts ( $\sim$ 1-5 419 mm) (Fig. 6J,K). Amphibole occurs in two distinct contexts: as inclusions in epidote and 420 albite porphyroblasts, and as a dominant  $S_S$  foliation-forming phase. Amphibole inclusions 421 record core-rim zonations evolving from magnesio-riebeckite to winchite, and matrix am-422 phibole record core-rim zonations evolving from ferro-winchite to actinolite (Figs. 8A,D). 423  $S_{S}$ -defining, syn- $D_{T_{2}}$  epidote porphyroblasts have pressure shadows filled with white mica, 424 calcite and albite, and are boudinaged, with necks filled by quartz and calcite (Fig. 6J, 425 8D). In blueschist facies fabrics at Fabrikas, the retrogressed  $S_S$  foliation comprises syn-426  $D_{T2}$  epidote porphyroblasts that contain rotated inclusion trails of quartz and glaucophane 427 and inclusions of garnet that preserve syn- $D_S$  spessartine-to-almandine zonations (Figs. 428 7G,H). Phengite and paragonite define C- and C'-planes of an extensional, top-to-the-E 429 shear fabric. Phengitic white mica reveals a tight range of Si atoms p.f.u. ( $\sim 3.33$ -3.39 430 a.p.f.u, Fig. B1), and Si content of C- and C'-defining phengite is identical (Fig. 7G, Fig. 431

<sup>432</sup> B1). Lineation-parallel brittle micro-boudinage of epidote and amphibole porphyroblasts <sup>433</sup> is common; epidote boudin necks are filled with quartz, and blue amphibole boudin necks <sup>434</sup> contain green amphibole needles. A planar  $S_{T2}$  fabric that cuts  $S_S$  is only found in the core <sup>435</sup> of  $F_{T2}$  folds (i.e.,  $S_{T2}$  crenulation cleavage at Delfini, Cisneros et al. (in press)).

#### 436 6 Geochronology

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#### 6.1 New multi-mineral Rb-Sr isochron petrochronology

All of the isochrons described herein have Mean Standard Weighted Deviations (MSWDs) 438 greater than 1, which suggests that the data dispersion exceeds that predicted by analytical 439 uncertainties (i.e., the data are overdispersed) (Wendt & Carl, 1991). However, MSWDs are 440 a reflection of analytical precision (e.g., Kullerud, 1991; Powell et al., 2002), and reflect the 441 goodness of fit of a regression line to the datapoints, which includes their analytical uncer-442 tainties. Our dataset has a very high analytical precision (calculated from reproducibility) 443 of standards measurements), which leads to a significant increase in the MSWD of a Rb-Sr 444 isochron when the regression line does pass through a datapoint's uncertainties (e.g., Fig. 445 9B). However, we consider our Rb-Sr ages reliable records of true deformation and meta-446 morphism events, after closer evaluation of our isochrons (see Table A1), despite their high 447 MSWDs. This is because the isochrons were contructed from mineral suites that our struc-448 tural and petrographic observations suggest are co-genetic, and the co-linearity of the data 449 are striking (with some justifiable exceptions discussed below). The high MSWD values may 450 reflect underestimation of our analytical uncertainties, or minor Rb-Sr disequilibrium during 451 metamorphism (perhaps due to incomplete recrystallization, e.g., Halama et al. (2018)) that 452 does not significantly affect our Rb-Sr ages (Table A1). 453

Sample SY1616 is an omphacite-blueschist collected at Kini Beach and records  $D_S$ (texturally identical to Fig. 7A). This sample yielded an age of 53.48 ± 0.65 Ma (MSWD = 5) based on a 10-point isochron defined by epidote, glaucophane, omphacite, five paragonite separates, garnet, and one phengite separate (Table 2, Fig. 9). To test the robustness of the isochron, several two- to five-point isochrons were calculated from combinations of the co-genetic phases; the age does not change but the MSWD is reduced (=1 for 2-pt isochrons by definition; <1 for 3- and 4-pt, and 1.4-1.7 for 5-pt).

Sample KCS1617 is a bimodal meta-volcanic schist collected at Azolimnos and records 461  $D_{T1}$  (similar to sample in Fig. 7C). This sample yielded an age of  $45.51 \pm 0.29$  Ma (MSWD) 462 = 8) based on a 7-point isochron defined by glaucophane, four paragonite separates, and 463 two phengite separates (Table 2, Fig. 9). Two garnet separates fell off of the isochron and 464 are discarded in the age calculation. We justify this based on microstructural observations 465 shown in Figure 7D; garnets preserve complex Ca-zonation patterns and may record pulsed 466 growth. Furthermore, garnets are  $D_S$  porphyroblasts and are not expected to be in isotopic 467 equilibrium with the  $D_{T1}$  fabric during incipient retrogression. Previous work suggests that 468 Sr isotopic zoning in garnets (Sousa et al., 2013) and/or isotopic inheritance from earlier 469 stages of metamorphism and poor homogenization during subsequent stages of metamor-470 phism (Romer & Rotzler, 2011) tend to make garnets poor candidates for constructing 471 Rb-Sr isochrons. Adding epidote to the isochron does not change the age  $(45.43 \pm 0.46)$ 472 Ma, n=8), but increases the MSWD to 23. Epidote is stable throughout subduction and 473 exhumation and could record subtle zonations that grew during subsequent deformation 474 events and therefore may not be co-genetic (e.g., Cisneros et al., in press). 475

<sup>476</sup> Sample KCS1621 is a quartz-mica schist collected from Delfini and records  $D_{T2}$  in <sup>477</sup> meta-sedimentary schists. It was collected from a fold limb of a structure like the one in <sup>478</sup> Fig. 5I, and is interlayered with quartz-schists on the decimeter-scale that locally preserve <sup>479</sup> blue amphibole lineations. This sample yielded an age of 37.06 ± 0.12 Ma (MSWD = <sup>480</sup> 13) based on a 7-point isochron defined by epidote, chlorite, 3 paragonite separates, and <sup>481</sup> 2 phengite separates (Table 2, Fig. 9). For this sample, various combinations of 2- to

Sample ID and Summary	Mineral	Rb (ppm) Sr	(mdd) 81	Rb / 86Sr	<u>+</u> 2σ 8	87Sr / 86Sr	$\pm 2\sigma$	
SV1616. Kini amnha <i>cita</i> anidata hluasahist	anidota (T 18-001)	0.17	1008	0.00035	1 738-07	0 703224	1.41E-05	
		21.0	147	100000	1 201 02	3000000000	1 415 05	
$DM(COUT) \rightarrow 0.000$ DM $O(D) \rightarrow 0.000$ DM $O(D) \rightarrow 0.000$ DM $O(D) \rightarrow 0.0000$ DM $O(D) \rightarrow 0.00000$ DM $O(D) \rightarrow 0.00000$ DM $O(D) \rightarrow 0.000000$ DM $O(D) \rightarrow 0.0000000$ DM $O(D) \rightarrow 0.0000000000$ DM $O(D) \rightarrow 0.0000000000000000000000000000000000$	glaucopnane (L1 0-01 0)	CT-0	140 . 5	100000	00-EUC.1	C77C0/.0	1.41E-U0	
Initial $87/86$ Sr: $0.703211 \pm 0.000012$	omphacite (L19-099)	0.28	31	0.025/1	1.29E-05	0./03235	1.41E-05	
MSWD = 5	paragonite (L19-097)	0.31	19	0.04765	2.38E-05	0.703244	1.41E-05	
	paragonite (L19-093)	0.31	16	0.05829	2.91E-05	0.703234	1.41E-05	
	paragonite. 0.5 A. 125-250 µm (L19-009)	0.37	17	0.06439	3.22E-05	0.703284	1.41E-05	
	gamet #1 (L18-011)	0.29	13	0.06562	3.28E-05	0.703261	2.04E-05	
	paragonite (L19-094)	-	44	0.07644	3.82E-05	0.703248	1.41E-05	
	paragonite (L19-096)	9	142	0.12305	6.15E-05	0.703289	1.41E-05	
	phengite, 0.4 A, 250-500 µm (L19-095)	35	24	4.26296	2.13E-03	0.706398	1.41E-05	
	removed from isochron gamet #2 (L19-098)	0.35	12	0.08338	4.17E-05	0.703353	1.41E-05	
KCS1617: Azolimnos glaucophane-mica blueschist	paragonite (L19-103)	6	199	0.13309	6.65E-05	0.706681	1.41E-05	
Solution on 7 points: $45.51 \pm 0.29 Ma$	paragonite (L19-102)	15	179	0.23810	1.19E-04	0.706776	1.41E-05	
Initial 87/86 Sr: 0.706592 + 0.000022	glaucophane (L18-002)	0.3	ب ۱	0.33478	1.67E-04	0.706783	1.41E-05	
MSWD = 8	paragonite (L19-100)	34 1	178	0.55161	2.76E-04	0.706927	1.41E-05	
	paragonite, 0.8 A, 125-250 µm (L18-007)	0	1 <del>.</del>	0.97194	4.86E-04	0.70/200	1.41E-05	
	phengite (L19-101)	112	112	2.8/985	I.44E-03	0./08433	1.42E-05	
	phengite, 0.7 A, 250-500 µm (L18-005)	219	43	14.89794	7.45E-03	0.716067	1.43E-05	
	removed from isochron							
	removed from is occurred enidete (T 18-003)	0.7	1486	0.00136	6 82F-07	0 706668	1 41F-05	
	cproce (±10-003)	0.60	8	0.26530	0.04EE-0/ 1 33E-04	0.706583	1.11E-05	
	gamet #1 (L19-004)	0.0	0 4	05502.0	1.33E-04 3 17E-04	0.706733	1.41E-05 1.41E-05	
		10.0	r			CC 100 1.0	CO-711-1	
VCC1631. Dolfini ordinalita mina maanaahiat	c to be and	-	1061	0.001.42	2 715 07	203302.0	1 415 05	
<b>EVENTIAL INFIBILITY OF A PARTICLE SUBJECTION</b> Solution on 7 mainter 37 $0.6 \pm 0.12 Ma$	epidote naraconite 0.6 A 250-500 um (1.19-225)	124	1061	0.60504	2.7 IE-07	0 706951	1.41E-05	
$Initial 87/86 Sr \cdot 0.706626 + 0.000033$	naraconite 0.5 A. 175-250 µm (L19-222)	326	39	2.37806	9.51E-04	0.707878	1 42E-05	
MSWD = 13	chlorite 0.25 A 250-500 um (T.19-226)	6	; =	2 41488	9 66F-04	0.707852	1 47E-05	
CT CHOW	naradonita 0.6 A 175-250 µm (I 19-224)	150	155	25962 6	1 12E-03	0.708052	1.42E-05	
	puregound, 0.0 m, 120-200 pur (210-224) shandia 0.5 A 105 050 um (1.10 002)	001	172	200717	0 79E 02	0.710220	1 445 05	
	phengite, 0.4 A, 250-500 µm (L19-221)	369	21	51.64803	2.07E-02	0.733354	1.47E-05	
	-							
	removed from is ochron		ţ					
	pnengue, 0.4 A, 125-230 µm (L19-220)	545	4	21.10233	8.40E-U3	0./1/1/3	cu-364.1	
SV1644: Delfini mineralization in enidosite boudin neck	enidote (L19-041)	0.73	2170	0.00031	1 23E-07	0 706608	1 41E-05	
Solution on 3 points: $36.05 + 2.6$ Ma	actinolite (L19-042)	17	123	0.39700	1.59E-04	0.706899	1.41E-05	
Initial 87/86 Sr: 0.706655 + 0.00058	white mica (L19-040)	303	30	29.24565	1.17E-02	0.721388	1.44E-05	
MSWD = 82	×							
SV1400. I atos montion dim amontal acidantes and	contraction of the second s	ſ	302	00000	5 JIE 03	L010L 0	0 10E 06	
S 1 1402: EQUOS FERCENDI FILI AFOUND EPINOSUE POU Solution on 5 points: $34.88 + 5.8 Ma$	white mice $< 125 \text{ um}$ (L19-029)	204 204	13	47.20997	1.89E-03	0.72438	0.10E-00 1.45E-05	
Initial 87/86 Sr: $0.70455 \pm 0.00363$	white mica 125-250 µm (L19-030)	227	10	68.82184	2.75E-02	0.73953	1.48E-05	
MSWD = 76000	white mica, 0.4 A, 250-500 µm (L19-031)	234	7	95.01809	3.80E-02	0.75342	1.51E-05	
	white mica, 0.6 A, 250-500 $\mu m$ (L19-032)	203	6	67.84958	2.71E-02	0.73643	1.47E-05	

listed. Uncertainty in age estimate (i.e.,  $\pm t$ ) are calculated assuming overdispersion, as  $\vec{z} = y \ge \sqrt{MSWD}$ , where y is the confidence interval for t using the appropriate number of degrees of freedom. Table 2: Summary of Rb and Sr concentrations and measured ratios from analyzed samples. Mineral separates discarded from calculated isochrons are



Figure 9: Multi-mineral Rb-Sr isochrons from Kini omphacitea blueschist (SY1616), Azolimnos quartz-mica blueschist (KCS1617), and Delfini quartz-mica greenschist (KCS1621). Grey insets are zoom-ins of low Rb/Sr separates outlined in black boxes. Faded grey symbols were excluded from isochron calculations. Multiple paragonite separates for each isochron are shown in black symbols. Sample SY1616 records  $D_S$ in the northern nappe, KCS1617 records  $D_{T1}$  in the central nappe, and KCS1621 records  $D_{T2}$  in the central nappe.  $D_T$ retrogression pre-dates the onset of regional core complex capture. Mineral abbreviations: ep = epidote, glc =glaucophane, om = omphacite, grt = garnet, parag = paragonite,ph = phengite, chl =chlorite.

6-pt isochrons all yield ages of ~35-37 Ma with MSWD varying from << 1 (e.g., 3-pt</li>
epidote-chlorite-paragonite), to 1 (e.g., 2-pt paragonite-chlorite) to 21 (e.g., 4-pt epidotechlorite-phengite-phengite). Even the isochrons that are not defined in high-Rb space (i.e.,
do not contain phengite) yield nearly identical ages to the 7-point isochron (Table A1).

Sample SY1644 is a collection of minerals precipitated in the neck of a brittlely-486 boudinaged epidote-rich lens from Delfini, and sample SY1402 is a greenschist facies reaction 487 rind at the margin of an epidote-rich lens from Lotos. These samples are representative of 488 semi-brittle boudinage associated with  $D_{T2}$  stretching (e.g., Fig. 5L). These samples yield 489 ages with reasonable uncertainties, but extremely high MSWDs. Sample SY1644 yielded 490 an age of  $36.1 \pm 2.6$  Ma (MSWD = 82) based on a 3-point isochron defined by epidote, 491 actinolite, and phengite, and sample SY1402 yielded an age of  $34.9 \pm 5.8$  Ma (MSWD = 492 76000) based on a 5-point isochron defined by apatite and 4 phengites (Table 2). For both 493 samples, 2-pt isochrons yield  $\sim 36$  Ma and  $\sim 29-36$  Ma, respectively (MSWD=1; Table A1). 494 We consider these data qualitative, but these ages are similar to and trend slightly younger 495 than KCS1621, which is consistent with our structural observations. 496

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#### 6.2 Synthesis of previously published metamorphic geochronology

We compiled all available metamorphic geochronology (to our knowledge, from 1987 through 2019) for Syros, and took inventory of the descriptions of deformation fabrics and metamorphic textures provided by the authors, to re-evaluate the significance of Eocene ages in the context of subduction vs. exhumation. A full compilation is shown in Supplementary Figure A1 and Table A2. We applied several qualitative filters to the dataset to derive a subset of ages that we can confidently attribute to fabric-forming events. The filters are justified as follows:

Zircon U-Pb ages are robust records of igneous crystallization, but as metamorphic 505 ages, can be difficult to place in pro- or retrograde context (Liu et al., 2006; Tomaschek et 506 al., 2003; Yakymchuk et al., 2017). We include U-Pb ages from Tomaschek et al. (2003) 507 for comparison with other ages, but we do not rely on it for island-scale interpretations. 508 Garnet Lu-Hf and Sm-Nd are considered reliable indicators of 'peak' subduction ages (i.e., 509 maximum depths) (Kendall, 2016; Lagos et al., 2007), because HP/LT garnets tend to grow 510 rapidly following reaction overstepping (Baxter & Caddick, 2013; Dragovic et al., 2012, 511 2015). Kendall (2016) and Lagos et al. (2007) both reported evidence for rapid, pulsed 512 garnet growth near peak conditions, in the form of overlapping 'bulk' and 'rim' Sm-Nd 513 ages, and tight clustering of Lu-Hf ages even though samples exhibited different Lu zoning 514 profiles and distributions between their cores and rims, respectively (see also Skora et al. 515 (2006)). This refutes the possibility that garnet cores grew significantly earlier than their 516 rims somewhere along the prograde path. One garnet age from Kini reported by Kendall 517 (2016) was removed from the final compilation because of its extremely low radiogenic 518 component and therefore large uncertainty. 519

White mica Ar/Ar has potential to capture timing of metamorphism during fabric 520 development. However, this system is highly susceptible to disequilibrium, partial (re-) 521 crystallization and mixed ages, and/or unpredictable loss or gain of radiogenic products, 522 making it difficult to interpret the geological significance of an age (Bröcker et al., 2013; 523 Laurent et al., 2016; Lister & Forster, 2016; Maluski et al., 1987). For the final dataset, we 524 only included five Ar/Ar step-heating ages with strong plateaus from micro-drilled grains 525 which all had clear micro-textural context (Laurent et al., 2017), and one strong plateau 526 age from a well-characterized marble shear zone (Rogowitz et al., 2014). We acknowledge 527 that in other HP terranes, even strong plateau ages have been previously attributed to 528 excess Ar (Sherlock & Arnaud, 1999). However, the Ar ages included in this study over-529 lap within reported error of independent Rb-Sr isochrons from rocks at the same locality 530 and/or similar structural levels, which suggests that at least locally, excess Ar is absent 531 (or apparently absent; cf. Ruffet et al. (1995)). Rb-Sr isochrons are typically considered 532



Figure 10: Metamorphic age vs. structural depth for the Syros nappe stack. The crosssection line A1-A6 is shown in Figure 2 and modified from Keiter et al. (2011). Only locations that crop out on the cross section line are labeled in white boxes; in the upper panel, other locations are indicated that project into or out of the page at the structural level shown (e.g. Kini is a normal fault-bounded block on the west side of the island and therefore is not shown on the cross section). Only ages that were confidently linked to the deformation scheme outlined in this paper are included. Clusters of ages outlined in black boxes are derived from the same locality, and collapse onto a single point on the cross section. Delfini symbols marked with stars were reported as blueschist-facies fabrics by Cliff et al. (2016); however, local preservation of glaucophane under greenschist facies conditions can be due to  $CO_2$ -bearing fluids. Pink half arrows mark the locations of inferred imbricate ductile thrusts; black half arrows indicate interpreted nappe-delimiting ductile shear zones, which were likely reworked as extensional structures during exhumation.

good indicators of fabric ages when the selected fabrics, and minerals defining them, are
well-characterized (Bröcker & Enders, 2001; Bröcker et al., 2013; Skelton et al., 2019). Furthermore, constructing a Rb-Sr isochron directly tests the assumption that selected minerals
were in isotopic equilibrium during metamorphism, which validates interpretation of Rb-Sr
ages as deformation-metamorphism events. Micro-drilling of white micas and co-genetic
Sr-rich phases (epidote or calcite) also provide strong textural context for regressed ages
(Cliff et al., 2016).

In some cases, we propose different interpretations of published data based on our own structural observations. Skelton et al. (2019), for example, interpreted three of their Rb-Sr isochrons from Fabrikas as peak metamorphic ages (i.e.,  $D_S$ ), but we interpret Fabrikas fabrics to relate to  $D_{T1-2}$ , associated with early exhumation (cf. Fig. 4K). This revised interpretation is supported by previous petrologic observations of eclogite breakdown to

blueschist, replacement of glaucophane by actinolite, and core-to-rim decrease in celadonite 545 component of foliation-forming phengitic white mica (Kotowski & Behr, 2019; Laurent et al., 546 2018) (see also Fig. 7), and structural studies that interpret Fabrikas to record dominantly 547 extensional top-to-the-E, exhumation-related deformation immediately beneath the Vari 548 Detachment. Furthermore, top-E extensional kinematics at Fabrikas clearly contrast with 549 other localities where prograde, top-S-SW deformation is preserved (compare stereonets 550 for Kini with Fabrikas in Fig. 4). Cliff et al. (2016) analyzed micro-drilled phengites 551 from blueschist-to-greenschist facies (i.e.,  $D_{T1}$  to  $D_{T2}$ ) extensional fabrics in calc-schists 552 and quartz-mica schists. Four of their samples from Delfini were described as blueschist-553 facies (black stars in Fig. 10); however, our observations point to penetrative greenschist 554 facies deformation at Delfini  $(D_{T_2})$ . Glaucophane is locally preserved in abundance in calc-555 schists at Delfini, and elsewhere on Syros. Rather than reflecting blueschist facies conditions 556 during deformation, this could be due to a glaucophane-stabilizing, CO<sub>2</sub>-bearing fluid under 557 greenschist facies P-T conditions (Kleine et al., 2014), or channelized fluid flow at lithological 558 boundaries leading to heterogeneous retrogression (Breeding et al., 2003). Finally, Rogowitz 559 et al. (2014) dated phengites from a top-E extensional greenschist facies marble shear zone, 560 and hypothesized the ages would be Miocene in accordance with the regional 'M2'. They 561 interpreted their Eocene ages as evidence that Miocene deformation did not reset the isotopic 562 signature. However, our results suggest their ages capture a true Eocene recrystallization 563 event (e.g., strong E-W stretching during greenschist facies  $D_{T2}$ ). 564

In Figure 10, the refined compilation (n=43) and new Rb-Sr geochronology (n=5) are projected onto the cross-section line drawn in Figure 2. Where possible, ages are labeled according to fabric generation. Faded data points were assigned textural identities but do not record penetrative strain (e.g., randomly oriented, radiating cluster). Key observations from new and compiled geochronology include:

- <sup>570</sup> 1.  $D_S$ , blueschist-to-eclogite facies deformation-metamorphism spans  $\sim 53$  to  $\sim 45$  Ma, <sup>571</sup> and is captured by a multi-mineral Rb-Sr isochron (this study, Kini), and Lu-Hf and <sup>572</sup> Sm-Nd garnet ages
  - 2. D<sub>S</sub> ages are oldest and well-clustered at Grizzas and Kini ( $\sim$ 53-52 Ma), and younger and potentially more widespread at Fabrikas ( $\sim$ 48-42 Ma).
- 3.  $D_{T1}$ , retrograde blueschist facies deformation-metamorphism spans ~50-40 Ma (Rb-Sr isochrons and Ar/Ar single grain analyses) and youngs with structural depth, i.e., from Kampos, to Azolimnos, to Fabrikas.
  - 4. D<sub>T2</sub>, retrograde greenschist facies deformation-metamorphism spans  $\sim$ 42-20 Ma (all Rb-Sr) and youngs with structural depth, i.e., from Palos ( $\sim$ 43-35 Ma), to Delfini ( $\sim$ 35-28 Ma), to Posidonia ( $\sim$ 28-20 Ma).
- 5. Rocks that presently occupy different structural levels developed distinct fabric generations contemporaneously. Examples include: Fabrikas  $D_S$  and Kampos  $D_{T1}$  (~50-45 Ma), Fabrikas  $D_{T1}$  and Palos  $D_{T2}$  (~43-38 Ma), and Posidonia  $D_{T2}$  and nonpenetrative greenschist metamorphism in the north (faded symbols, ~25-20 Ma). In other words, retrograde blueschist and greenschist facies deformation-metamorphism occurred first in the structurally highest units and progressed structurally downwards with time.

# <sup>588</sup> 7 Synthesis of structural and petrologic data and interpreted Deformation <sup>589</sup> Metamorphism history

#### 7.1 $D_R$ P-T conditions

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<sup>591</sup> We interpret the  $D_R$  fabric as the oldest recognizable in the CBU, and that it formed <sup>592</sup> under lawsonite-blueschist facies conditions based on several lines of evidence: (1)  $D_R$  inclu-<sup>593</sup> sion trail mineralogy (e.g., glaucophane, omphacite, phengite); (2) pseudomorphs of  $D_{R-S}$ <sup>594</sup> lawsonite included in  $D_S$  garnets from meta-basites on Syros (also seen on Sifnos) (Okrusch



Figure 11: Preferred, schematic P-T-D-t path for the CBU, consistent with observations and analytical results from this study. The shape of the path is modified from Schumacher et al. (2008). Amphibole stability fields constraining  $D_{T2}$  temperatures are from Otsuki and Banno (1990). The timing of metamorphism labeled along the P-T loop corresponds to progressive subduction and exhumation of three distinct tectonic slices (the northern, central, and southern nappes; see Sections 6, 7 and Fig. 10). Mineral abbreviations: crs = crossite (sodic amphibole), mg-rieb = magnesio-riebeckite, wch = winchite, act = actinolite. Facies fields defined in Figure 3.

& Bröcker, 1990; Ridley, 1982); and (3) syn-kinematic  $D_{R-S}$  omphacite blasts recording 595 up-pressure, core-to-rim zonations marked by increasing jadeite component (Fig. 7A) (cf. 596 Thompson, 1974). Lawsonite and epidote appear to have both been stable in mafic bulk 597 compositions during  $D_R$ , with lawsonite growing later on the prograde path under higher-598 pressure conditions (cf. Ballevre et al., 2003). This is consistent with textural observations 599 of lawsonite growing late, syn- and post-tectonic with respect to the  $S_R$  foliation, incorpo-600 rating inclusions of garnet (which also grows near peak pressures, cf. Baxter and Caddick 601 (2013); Dragovic et al. (2012, 2015)), and being included by garnet. 602

#### $_{603}$ 7.2 D<sub>S</sub> deformation and P-T conditions

<sup>604</sup> Deformation stage  $D_S$  captures peak metamorphic conditions, and produced: (1) an <sup>605</sup> axial plane schistosity,  $S_S$ , associated with tight to isoclinal folds ( $F_S$ ) that fold  $S_R$ , record <sup>606</sup> asymmetric top-to-the-S-SW sense of shear, and have S-SW-plunging fold axes; (2) SSW-

to-S-plunging mineral lineations; (3) a blueschist-to-eclogite facies fabric containing syn-607 kinematic garnet, omphacite, and (now pseudomorphed) lawsonite porphyroblasts; and (4) 608 chemical zonations in glaucophane and omphacite that record syn-kinematic increase in 609 pressure and temperature. New and compiled metamorphic geochronology demonstrate 610 that different structural levels of the CBU on Syros experienced peak conditions and  $D_S$ 611 deformation at different times (i.e. younging with structural depth, cf Fig. 10; discussed 612 further below). However, it appears that each tectonic slice experienced similar P-T trajec-613 tories, including peak P-T, despite subducting at different times. 614

615 We do not provide new quantitative constraints on  $D_S$  metamorphic conditions, but peak P-T for the  $D_S$  fabric shown in Figure 11 are consistent with our petrologic obser-616 vations and previous studies and are justified as follows. Peak temperatures have been 617 calculated from garnet-omphacite major element exchange for mafic blueschists and eclog-618 ites (450-550°C) (Laurent et al., 2018; Okrusch & Bröcker, 1990; Rosenbaum et al., 2002; 619 Schliestedt, 1986); the upper limit of glaucophane stability in marble ( $\sim 500^{\circ}$ C at  $\sim 15$ -620 16 kbar; Schumacher et al. (2008)); and calculated lawsonite-out reactions that predict 621 up-temperature, prograde dehydration according to the reaction lawsonite = epidote +622 paragonite +  $H_2O$ ) at ~400-500°C over ~12-20 kbar (depending on bulk rock and fluid 623 composition) (Evans, 1990; Liou, 1971; Philippon et al., 2011; Schumacher et al., 2008) 624 (Fig. 11). Raman Spectroscopy of Carbonaceous Material from graphite schists suggests 625 slightly higher temperatures of  $\sim$ 540-560°C (Laurent et al., 2018). Observed porphyrob-626 last stability (e.g. lawsonite pseudomorph inclusions in garnets and vice versa), amphibole 627 chemistry, and the volumetric dominance of glaucophane-bearing marbles throughout the 628 CBU on Syros are generally consistent with peak T of  $\sim 500-550^{\circ}$ C. 629

Reported peak pressures for  $D_S$  are variable in the literature, and challenging to rec-630 oncile. Early conventional thermobarometry suggested peak P of  $\sim 12-18$  kbar in mafic 631 blueschists and eclogites (Dixon, 1976; Okrusch et al., 1978; Okrusch & Bröcker, 1990; 632 Schliestedt, 1986). These pressures are supported by recent solid inclusion quartz-in-garnet 633 barometry constraining garnet growth at Kini, Kalamisia, Delfini, and Lotos to  $\sim$ 13-17 kbar 634 (Behr et al., 2018; Cisneros et al., in press). However, more recent thermodynamic modeling 635 accounting for garnet fractionation suggests rocks reached  $\sim 22-24$  kbar (Laurent et al., 2018; 636 Skelton et al., 2019; Trotet, Jolivet, & Vidal, 2001). We consider this unlikely based on the 637 abundance of  $S_S$  paragonite and absence of kyanite in meta-mafic rocks, which suggests 638 that the upper stability limit of paragonite at  $\sim 20-23$  kbar was not reached (Okrusch & 639 Bröcker, 1990; Schliestedt, 1986; Skelton et al., 2019) (Fig. 11), although we acknowledge 640 that the kyanite-in reaction is strongly dependent on bulk rock composition (cf. Laurent et 641 al., 2018). Large differences in P-T estimates between traditional phase equilibria and recent 642 thermodynamic modeling may reflect arbitrary choices of thin section domains selected as 643 representative bulk compositions (e.g., Lanari & Engi, 2017). This effect has been demon-644 strated for CBU lithologies on Syros (see Fig. 15 in Laurent et al., 2018) and is especially 645 likely in garnet-bearing rocks, due to the strong disequilibrium effect that garnet exerts on 646 local bulk composition (Lanari et al., 2017; Lanari & Engi, 2017; Lanari & Duesterhoeft, 647 2018). It is also possible that higher-P conditions are real, but have not vet been sampled 648 by solid inclusion techniques. 649

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#### 7.3 $D_T$ deformation and P-T conditions

 $D_T$  represents retrograde deformation under blueschist-to-greenschist facies conditions 651 during exhumation.  $D_T$  is distinguished by: (1) transposition of the  $S_S$  foliation during 652 formation of upright, open to tight  $F_T$  folds and progressive new  $(S_T)$  fabric development; (2) 653 lineation orientations that rotate from N-NE  $(D_{T1})$  to E-W  $(D_{T2})$  with progressive strain and 654 (in general) increasing greenschist facies retrogression; (3) dominantly coaxial, but locally 655 non-coaxial deformation; and (4) chemical zonations in amphibole tracking syn-kinematic 656 decrease in pressure and temperature during development of a composite, reworked foliation 657 (e.g.  $S_S$  is locally deformed and metamorphosed during  $D_T$ ). 658

During  $D_T$ , foliation-forming amphiboles transition from glaucophane to (magnesio) 659 riebeckite, to winchite, to actinolite. The progressive decrease of total Al,  $Na_B$ , and 660  $(Na+K)_A$  in amphibole indicates that P and T decreased as  $D_T$  evolved. Glaucophane 661 coronas that develop around eclogite pods during  $D_{T1}$  are chemically similar to syn- $D_S$ glaucophane, and retrogressed glaucophane records decreasing Al<sup>vi</sup> (KCS53, KCS52B) and 663  $Na_B$  (KCS53) from core to rim, and a minor increase in  $(Na+K)_A$  as (Fig. 8, Fig. B1). 664 These signatures indicate decompression and potentially slight warming (Ernst & Liu, 1998; 665 Laird & Albee, 1981; Moody et al., 1983; Raase, 1974; Robinson, 1982), at the subduction-666 to-exhumation transition. 667

 $D_{T2}$  is characterized by foliation-forming calcic amphiboles, and local relicts of sodic 668 amphiboles are found as inclusions in porphyroblasts. The transition from sodic-to-calcic 669 amphibole recorded here indicates cooling during decompression (Brown, 1977; Ernst & 670 Liu, 1998; Laird & Albee, 1981; Maruyama et al., 1983; Moody et al., 1983; Otsuki & 671 Banno, 1990; Schmidt, 1992; Thompson, 1974) through albite-epidote blueschist facies and 672 eventually greenschist facies conditions (Fig. 11). This P-T trend is supported by the 673 abundance of albite and titanite overgrowths on rutile, boudin neck quartz-calcite oxygen 674 isotope temperatures and quartz-in-epidote inclusion barometry (Cisneros et al., in press), 675 and decreases from core-to-rim in celadonite component of foliation-forming white micas 676 (Laurent et al., 2018). While we cannot rule out an initial phase of isothermal decompres-677 sion at high pressures, our documented amphibole geochemical zonations support cooling 678 during decompression at moderate pressures and do not support a positive thermal excur-679 sion into the epidote-amphibolite facies field (e.g., edenite, pargasite, crossite), as suggested 680 by Laurent et al. (2018), Lister and Forster (2016), and Trotet, Jolivet, and Vidal (2001) 681 P-T-D paths. Notably, Aravadinou et al. (2016) reported syn-kinematic amphibole zona-682 tions from retrograde fabrics in the CBU on Sifnos that also support exhumation along a 683 cooling-during-decompression pathway (see also Schmädicke and Will (2003)). 684

#### <sup>685</sup> 8 A new tectonic model for the CBU on Syros

Here we synthesize protolith age constraints, and our structural, petrologic, and geochrono logic data, and propose a revised tectonic model for the CBU on Syros. First we present a
 pre-subduction configuration, then discuss a stepwise reconstruction capturing progressive
 subduction, underplating, and exhumation, leading to the three-part tectonic stack exposed
 on Syros today.

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#### 8.1 Pre-subduction configuration

Figure 12 builds on previous work (e.g., Papanikolaou, 1987, 2013; Ring et al., 2010; 692 Van Hinsbergen et al., 2020) and illustrates a highly schematic paleogeographic setting for 693 the CBU on Syros and Southern Cyclades immediately prior to subduction at  $\sim 60$  Ma. Peri-694 Gondwanan Cycladic Basement, cross-cut by Carboniferous magmatism (~315 on Syros, 695 Tomaschek et al. (2008); 330-305 in Southern Cyclades, Flansburg et al. (2019)), was rifted 696 in the Triassic ( $\sim 240$  Ma, Keay (1998); Löwen et al. (2015)). Syn-rift bimodal volcanics 697 and sediments intruded and blanketed the hyper-extended margin; these will become the 698 diagnostic marker horizons referred to as banded tuffitic schists and bimodal meta-volcanics 699 mapped by Keiter et al. (2011) (orange and dark grey in Fig. 12; cf. Fig. 2). Rifting was 700 followed by passive margin sedimentation of psammites, debris flows, and carbonates from 701 the Triassic ( $\sim 230$ ) through the Cretaceous ( $\sim 75$  Ma) (Löwen et al., 2015; Poulaki et al., 702 2019; Seman, 2016; Seman et al., 2017). Carbonates interbedded with clastic sediments may 703 be the protolith for the Syringas Marker Horizon (Keiter et al., 2011). Cretaceous rifting 704  $(\sim 80 \text{ Ma}, \text{Tomaschek et al.} (2003))$  dissected the hyper-extended basement and passive 705 margin sedimentary sequence, forming a small oceanic-affinity (backarc?) basin (Bonneau, 706 1984; Cooperdock et al., 2018; Fu et al., 2012; Keiter et al., 2011). 707



Figure 12: Schematic paleogeographic reconstruction of the CBU, with emphasis on lithologies exposed on Syros at  $\sim 60$  Ma. The zoomed-in cross section is modified from Seman (2016). Stepwise evolution of the CBU during subduction is shown in the next figure.

The most interpretive part of Figure 12 is the locations of mafic igneous rocks. These 708 rocks could reflect off-axis, shallow intrusions related to Cretaceous rifting, or older mafic 709 igneous rocks related to Triassic rifting; protolith ages have not been determined for Kini, 710 Vaporia, Kalamisia, or Fabrikas mafic rocks. Regardless of their origin, the key point is that 711 protoliths for mafic blueschists and eclogites were distributed throughout the CBU before 712 subduction, rather than only coming from the small ocean basin in the north. While the 713 precise locations and sources of these mafic volcanics are unknown, this interpretation is 714 supported by different ages of peak metamorphism in blueschists and eclogites that crop 715 out at Kampos/Kini and Fabrikas (see Fig. 10 and discussion below). 716

This paleogeographic interpretation allows us to split the CBU on Syros into three sub-domains characterized by distinct, but related, protolith assemblages (dashed boxes in Fig. 12). These sub-domains are the precursors to each of three main tectonic slices that comprise the structural pile on Syros today.

721

#### 8.2 Peak subduction of the Palos-Gramatta-Kampos nappe ( $\sim$ 53 Ma)

The Palos-Gramatta-Kampos nappe (northern nappe) comprises Cretaceous oceanic 722 lithosphere intruded into Triassic bimodal rift volcanics and Triassic-to-Cretaceous sedi-723 ments (Fig. 12). Our view of this structurally highest subunit differs from that of Laurent 724 et al. (2016)'s 'Kampos subunit' in that it does not solely comprise meta-mafic lithologies, 725 and it does not include the map-scale meta-mafic lenses at Vaporia, Kalamisia, and Fabrikas 726 (see also Section 9). Garnet Lu-Hf from Grizzas and new Rb-Sr isochrons from Kini yield 727 identical ages of  $D_S$  fabric development within error, suggesting that Kini was originally 728 subducted as part of the northern nappe (Fig. 10), and was down-dropped by late-stage, 729 high-angle normal faults to its present position (cf. Keiter et al., 2011; Ridley, 1984). 730



Figure 13: Caption on next page.

Figure 13: (Previous page.) Block diagrams illustrating the structural evolution and timing of subduction and exhumation recorded by the three tectonic slices in the Syros nappe stack. Compare stepwise subduction of sub-units to the paleogeography in Figure 12. Horizontal scaling is equivalent to subduction rates of  $\sim$ 2-3 cm/yr and diagrams are roughly 2x vertically exaggerated. The thickness of the interface is exaggerated for clarity.

Prograde-to-peak subduction was characterized by extremely high top-to-the-SSW 731 asymmetric shear strain and at least two stages of foliation development under blueschist-732 to-eclogite-facies conditions ( $D_R$  and  $D_S$ ; Fig. 13A). Metamorphism led to the forma-733 tion of blueschists and eclogites under identical P-T conditions, reflecting differences in 734 bulk composition and/or protolith texture (Kotowski & Behr, 2019; Skelton et al., 2019). 735 Subduction-related strain was very heterogeneous. This is evidenced by rheologically strong 736 meta-gabbros at Grizzas and Kini that preserve primary igneous features (Keiter et al., 737 2004, 2011; Kotowski & Behr, 2019; Laurent et al., 2016). Furthermore, early prograde 738 SW-plunging fold axes and mineral lineations are preserved at Grizzas, Kini, and locally 739 along Kampos Belt. Girdled glaucophane lineations (e.g., Kini, Kampos) record continuous 740 kinematic rotation from SW to N-S during subduction. Top-to-the-SW and top-to-the-S 741 asymmetric thrusting are diagnostic of subduction kinematics (Blake Jr et al., 1981; Keiter 742 et al., 2004; Laurent et al., 2016; Philippon et al., 2011; Ridley, 1984), indicated by SW-743 verging thrusts on mainland Greece (Jacobshagen, 1986). Despite the extremely high shear 744 strains during subduction, Seman (2016) was able to identify a relict young-on-old depo-745 sitional relationship preserved between Kampos Belt meta-igneous rocks and the overlying 746 Gramatta meta-sedimentary package. This relationship, seen in the detrital zircon U-Pb 747 geochronologic record, suggests that the contact between the two units has not been sub-748 stantially disturbed during subduction and exhumation. However, some small-offset ductile 749 thrusting likely 'smeared' the Palos-Gramatta meta-sedimentary rocks along the top of 750 Kampos Belt volcanics (e.g., small thrust in Fig. 13A). 751

The northern nappe was underplated after  $D_S$  development and before  $D_T$  exhuma-752 tion, removing it from the active subduction interface. Detrital zircon U-Pb data support 753 independent structural observations that suggest a large thrust separates the northern nappe 754 from the central nappe beneath it (Keiter et al., 2004; Laurent et al., 2016; Seman, 2016) 755 (Fig. 13A; structurally highest black thrust in cross section in Fig. 10). This thrust 756 placed Triassic and Cretaceous igneous rocks (Kampos) atop Cretaceous (Syringas) sedi-757 ments and allowed the underplated nappe to exhume, while subduction of the intermediate 758 nappe occurred beneath it. 759

760 761

### 8.3 Subduction-and-imbrication of the Syringas-Azolimnos nappe and blueschist facies exhumation of the northern nappe ( $\sim$ 50 Ma)

The Syringas-Vaporia-Azolimnos nappe (central nappe) occupies the central portion 762 of the island and comprises interbedded Triassic-to-Cretaceous meta-sedimentary schists, 763 meta-volcanic schists, and meta-carbonates (Fig. 12). In contrast to Laurent et al. (2016)'s 764 central Chroussa subunit, we suggest that Vaporia and Kalamisia meta-mafic lenses belong 765 to this central slice and record primary intrusive and/or depositional relationships with 766 surrounding CBU meta-sediments (cf. Keiter et al. (2011)). The timing of peak  $D_S$  during 767 subduction of the central nappe is unknown, but based on this tectonic model and the 768 well-constrained ages of peak subduction in the northern and southern nappes, it likely 769 reached peak conditions at  $\sim 50$  Ma (this is testable with garnet geochronology from Delfini, 770 Vaporia, or Kalamisia).  $D_S$  in the central nappe is largely overprinted during subsequent 771 exhumation-related deformation, but early fabrics are reminiscent of  $D_S$  in the northern 772 nappe and similarly consist of isoclinal folds and strong cleavage development (e.g., textural 773

relicts at Azolimnos). While  $D_S$  developed in the central nappe,  $D_{T1}$  exhumation-related blueschist facies fabrics formed at the same time in the northern nappe (Fig. 10, 13B).

Detrital zircon U-Pb geochronology and Maximum Depositional Ages (MDAs) of meta-776 sedimentary rocks in the central nappe reveal several old-on-young stratigraphic inversions, 777 which suggest imbrication occurred along cryptic ductile thrusts during subduction (Seman, 778 2016) (pink thrusts in Fig. 10, pink stars in Fig. 13B). For example, Seman (2016) doc-779 umented an old-on-young stratigraphic inversion where Triassic meta-volcanics at Delfini 780 are thrust atop Cretaceous meta-sediments east of Kini (Fig. 2). Even though these struc-781 782 tures cannot be seen in the field, the presence and locations of inferred thrusts are further supported by the repeated Syringas Marker Horizon, which never appears overturned (or-783 ange circles and pink stars in Fig. 10 and 13B, respectively) and repetition of Triassic 784 bimodal meta-volcanic sequences (orange and dark grey in Figs. 2 and 13B). Thus, we 785 propose that the central nappe is bounded by larger nappe-delimiting thrusts to its north 786 and south, and also comprises smaller-scale thrusts accommodating internal imbrication of 787 CBU meta-sedimentary rocks, shown in the cross section in Figures 2 and 10. 788

During peak subduction of the central nappe  $(D_S)$ ,  $D_{T1}$  deformation occurred in the 789 northern nappe, and was characterized by upright folding, crenulation cleavage development, 790 and NE-trending fold axes and mineral lineations. This kinematic transition is marked by 791  $\sim$ 120-180° rotation in dominant mineral lineations and fold axis orientations from the S-SW 792 to the N-NE. We interpret the crenulation cleavage formed during  $D_{T1}$  to be a signature of 793 the 'subduction-to-exhumation transition,' when rocks 'turn the corner' in the subduction 794 channel, based on the observation that crenulation lineations are decorated by high-pressure 795 phases with compositions similar to peak  $D_S$  blueschist-to-eclogite facies conditions (Kini, 796 Figs. 6E).  $D_{T1}$  and subsequent strain localized in weaker CBU meta-sediments during ex-797 humation (e.g., Palos, Gramatta), whereas prograde subduction-related fabrics are locally 798 preserved in rheologically strong meta-gabbros at Grizzas and Kini. These observations sup-799 port previous structural studies that suggest exhumation-related deformation progressively 800 localized towards the bottom of the structural pile, leading to more pervasive greenschist 801 facies overprints in the south of the island (Laurent et al., 2016; Lister & Forster, 2016; 802 Ring et al., 2020). 803

The structural base of the central nappe is difficult to pinpoint. However, metamorphic 804 geochronology suggests that it is somewhere below Azolimnos and must be above the Fab-805 rikas tectonostratigraphic horizon, which comprises the third and lowermost nappe. The presence of a nappe-bounding thrust is also consistent with progressive southward facies 807 changes in the rock types, as carbonate horizons thin substantially and paragnesis mate-808 rial crops out at the island's southern tip, as well as the presence of thrust fault-bounded 809 marble klippe exposed locally on the southern portion of the island (Figs. 2 and 10). Laurent 810 et al. (2016) traced a nappe-bounding shear zone across the island based on the observed 811 intensity of greenschist overprinting and the disappearance of marbles, and suggested its 812 western extent crops out as splaying shear zones above and below the Delfini peninsula (i.e. 813 their 'Achaldi-Delfini shear zone'). If this is the case, then new and compiled geochronol-814 ogy suggests that greenschist facies overprinting in the southern slice spanned  $\sim$ 36-20 Ma. 815 Alternatively, if the nappe-bounding shear zone occupies a slightly deeper structural level 816 (i.e. right beneath Delfini peninsula, such that Delfini represents the lowermost portion 817 of the central nappe that is heavily retrogressed under greenschist facies conditions), then 818  $D_{T_{1-2}}$  development in the central slice is slightly older (~35-30 Ma) than in the south-819 ern slice ( $\sim 30-25$  Ma). This ductile nappe-bounding structure accommodated underplating 820 of the central nappe at  $\sim 50$  Ma while the southern nappe was still subducting, and was 821 subsequently reworked during exhumation. 822

823 824

## 8.4 Peak subduction of the Fabrikas nappe and blueschist facies exhumation of the central nappe ( $\sim$ 48-43 Ma)

The Fabrikas nappe (southern nappe) comprises Triassic meta-sedimentary schists, 825 meta-volcanic schists, and thinner meta-carbonate horizons compared to the central nappe 826 (cf. Keiter et al., 2011); this meta-sedimentary sequence was spatially associated with mafic 827 igneous rocks with unknown crystallization ages (Fig. 12). The primary difference between 828 our southern slice and Laurent et al. (2016)'s Posidonia subunit is that it contains the 829 Fabrikas meta-mafic lens, which they placed in the structurally highest Kampos subunit. 830 Otherwise, our structural measurements and metamorphic observations are similar. Peak 831 subduction of the Fabrikas nappe is well-constrained at  $\sim$ 48-43 Ma by garnet Sm-Nd crys-832 tallization ages (Kendall, 2016). A weighted mean of Fabrikas garnet ages using Isoplot 833 (Ludwig et al., 2010), weighted by assigned uncertainties, is  $45.1 \pm 2.9$  Ma (2 sigma) (Fig. 834 10) and is distinctly younger than peak subduction at  $\sim 53$  Ma of the northern nappe. The 835 subduction-to-exhumation transition, or underplating event, of the southern nappe is brack-836 eted by peak subduction recorded by garnet Sm-Nd ages and blueschist facies retrogression 837 recorded by Rb-Sr multi mineral isochrons, and occurred somewhere between  $\sim$ 42-39 Ma 838 (Skelton et al., 2019). 839

Between  $\sim$ 48-45 Ma, rocks of the central nappe exhumed in the subduction channel un-840 der blueschist facies conditions. Retrograde blueschist fabrics at Azolimnos, well-constrained 841 at  $\sim 45$  Ma, overlap with garnet Sm-Nd ages at Fabrikas but are older than retrograde 842 blueschist fabrics at Fabrikas, which directly supports the separation of the central and 843 southern tectonic slices. At this time, mafic blueschists and eclogites and surrounding meta-844 sedimentary schists in the central nappe developed identical  $D_{T1-2}$  structures (e.g., Vaporia 845 and overlying meta-sedimentary rocks, and Kalamisia and Azolimnos; Fig. 4). This indi-846 cates that during  $D_{T1-2}$ , mafic blueschists and eclogites and surrounding meta-sedimentary 847 rocks were exhumed together, and in some places, strain was partitioned between them. 848 Therefore, even if mafic blueschists and eclogites reached higher pressures on their prograde 849 path, they must have been partially exhumed and juxtaposed with CBU meta-sediments by 850  $\sim 45$  Ma to explain concordant exhumation-related structures. 851

852 853

### 8.5 Exhumation of the Syros nappe-stack in the subduction channel under greenschist facies conditions (through $\sim 20$ Ma)

Between  $\sim$ 44-20 Ma, greenschist facies  $D_{T2}$  fabrics continuously developed throughout 854 the accreted CBU stack, as each underplated nappe was exhumed in series from north to 855 south. Retrograde greenschist facies deformation-metamorphism occurred first in the struc-856 turally highest northern nappe, and migrated structurally downward through time (see also 857 Ring et al. (2020) and Roche et al. (2016)). Exhumation imparted penetrative deforma-858 tion that progressively transposed older fabrics under blueschist facies  $(D_{T1})$  and eventually 859 greenschist facies  $(D_{T2})$  conditions. Previous geochronology and our new Rb-Sr isochron 860 from Delfini suggest that fabrics formed during blueschist-to-greenschist facies retrogres-861 sion can be precisely dated if appropriate mineral assemblages are targeted. Furthermore, 862 exhumation-related  $D_{T1}$  and  $D_{T2}$  strain was dominantly coaxial and well-distributed. This is 863 evident from symmetric strain shadows on garnets, ductile pinching of partially retrogressed 864 eclogites at Agios Dimitrios, and outcrop-scale greenschist facies folds with sub-horizontal 865 E-W trending hinge lines with hinge-parallel symmetric boudinage of competent blueschist 866 and epidote-rich lenses (e.g., Delfini and Lotos; Figs. 5, C1). 867

The youngest dynamic  $D_{T2}$  greenschist facies fabrics associated with subduction channel exhumation are ~25-20 Ma and are recorded in the southern nappe (Fig. 10). At this time, greenschist facies metamorphism continued in the northern and central nappes, but was not associated with penetrative strain (e.g., random grains, radiating clusters, decussate textures; Cliff et al. (2016)). These observations indicate strain progressively localized towards the base of the stack through time. Patchy, static metamorphism in the northern and central nappes may reflect local fluid availability as deformation migrated structurally
 downward.

876

#### 8.6 Upper plate extension and core complex capture

Slab rollback accelerated  $\sim 23-21$  Ma, which is constrained by dating of detachment 877 faults and supra-detachment sedimentary basins that developed in response to upper crustal 878 extension (Gessner et al., 2013; Ring et al., 2010). Rollback led to core complex capture 879 and southward migration of the volcanic arc through the former forearc (e.g., the Tinos 880 granite,  $14.6 \pm 0.2$  Ma, Bolhar et al. (2010)). CBU rocks were exhumed in the footwall 881 of the North and West Cycladic Detachment Systems and related smaller-scale structures 882 during 'post-orogenic' exhumation (Jolivet et al., 2010; Soukis & Stockli, 2013). On Syros, 883 the Vari Detachment was reactivated as a semi-brittle to brittle extensional structure and 884 accommodated late stages of exhumation (Fig. 2). 885

Soukis and Stockli (2013) presented low-temperature zircon and apatite (U-Th)/He 886 thermochronology, and concluded that the southern Syros CBU was juxtaposed with two 887 structurally higher upper-plate units, the Upper Unit (intermediate structural level) and 888 Vari Unit (structurally highest), along at least two semi-brittle detachment faults (Fig. 13C, 889 labeled as future structures). While the Tinos Detachment exhumed CBU rocks between 890  $\sim$ 22-19 on what would become neighboring Tinos Island, low-angle normal faults juxtaposed 891 the Vari and Upper Units on Syros. Exhumation of the Vari and Upper Units at  $\sim 13-15$  Ma 892 was roughly coeval with magmatism on Tinos but the Syros CBU exhumed later, ~8-10 Ma, 893 beneath the Vari Detachment (Soukis & Stockli, 2013). Final exhumation of the CBU on 894 Syros occurred in multiple, temporally distinct, rapid episodes of unroofing. Exhumation 895 beneath the Vari Detachment was rapid, but only accommodated the final  $\sim 6-9$  km of 896 vertical exhumation (Ring et al., 2003). 897

#### <sup>898</sup> 9 Implications

The tectonic model described above has several similarities and differences compared 899 to previous tectonic models. First, our results agree with previous studies suggesting that 900 Syros is composed of distinct tectonic slices that reached peak conditions at different times 901 (Laurent et al., 2017; Lister & Forster, 2016; Ring et al., 2020; Uunk et al., 2018). However, 902 while some previous work has identified two slices in the north and south (Ring et al., 2020; 903 Uunk et al., 2018), our data indicate that there may be a third slice in between. The timing 904 of subduction of Fabrikas rocks provides key constraints on how many tectonic slices exist. 905 Skelton et al. (2019) interpreted their Rb-Sr isochrons as records of peak subduction at  $\sim 40$ 906 Ma, which is younger than garnet crystallization ages presented by Kendall (2016). If Fab-907 rikas did reach peak conditions at  $\sim 40$  Ma, this supports the inference of a central slice above 908 Fabrikas, because our new Rb-Sr isochron from Azolimnos indicates that rocks occupying a 909 higher structural level above Fabrikas experienced blueschist facies retrogression at  $\sim 45$  Ma, 910 and therefore must have reached peak conditions before that. If the garnet crystallization 911 ages presented by Kendall (2016) are accurate records of peak subduction of the southern 912 Fabrikas nappe unit (e.g. weighted mean at  $\sim 45$  Ma), then this also supports the interpre-913 tation of an intermediate slice, which was exhuming at the same time as Fabrikas nappe 914 reached peak conditions. Future structural and geochronologic investigations should target 915 garnet-bearing lithologies within the proposed central nappe to constrain the timing of peak 916 subduction in this intermediate structural unit. Our study places quantitative constraints 917 bracketing the timing of subduction of each slice, demonstrates that deformation occurred 918 continuously throughout the Eocene and Oligocene, and illustrates that subduction- and 919 exhumation-related fabrics developed contemporaneously at different structural levels. 920

Furthermore, we argue that mafic blueschists and eclogites do not exclusively occupy the structurally highest tectonic slice, in contrast to Laurent et al. (2016) and Trotet, Jolivet, and Vidal (2001). Rather, protoliths for mafic blueschists and eclogites were present
throughout the CBU before subduction and therefore appear to record primary relationships 924 (cf. Keiter et al., 2011). This implies that the mafic blueschists and eclogites at Vaporia, 925 Kalamisia and Fabrikas are not separated from surrounding schists and marbles by shear 926 zones and/or detachments, as shown for the 'Kampos subunit' of Laurent et al. (2016). 927 The primary observations supporting that Fabrikas cannot belong to the same subducting 928 unit are that Fabrikas meta-volcanics record peak metamorphism that is distinctly younger 929 than that of Kampos and Kini, Fabrikas crops out towards the southern end (i.e. bottom) 930 of the north-dipping structural pile, and Fabrikas meta-volcanics are associated with more 931 meta-carbonate and meta-clastic sedimentary lithologies than Kampos and Kini suggesting 932 they represent subduction of different protolith assemblages. Moreover, the fact that Fab-933 rikas occupies the immediate footwall of the Vari Detachment does not necessarily imply 934 that it belongs to the structurally highest unit. Even though the Vari Detachment has 935 been interpreted as the paleo-subduction channel roof, continuous ductile extension along 936 a shallowly to moderately dipping structure throughout the Eo(?)-Oligocene, in addition 937 to the proposed 6-9 km of semi-brittle exhumation accommodated by  $\sim 20$  km of localized 938 slip in the Miocene (Ring et al., 2003), can easily explain tectonic removal of the uppermost 939 units. This process would juxtapose structurally deeper CBU units with the Upper Unit in 940 the hanging wall. 941

Our observations indicate that prograde textures are locally preserved in mafic blueschists 942 and eclogites (cf. Keiter et al., 2004), but the majority of the Syros CBU has been over-943 printed during subduction channel exhumation (cf. Bond et al., 2007; Rosenbaum et al., 944 2002; Trotet, Vidal, & Jolivet, 2001). Heterogeneous rock types that occupy a given nappe 945 were subducted and exhumed together, and therefore experienced identical P-T paths (in 946 contrast to Trotet, Vidal, and Jolivet (2001); Trotet, Jolivet, and Vidal (2001)). There-947 fore, differences in strain, metamorphic mineral assemblages, and/or preserved kinematics 948 between mafic blueschists and eclogites and meta-sedimentary rocks can be attributed to 949 relative strengths, bulk composition, and fluid availability (and composition) during meta-950 morphism (see Schmädicke and Will (2003) for a similar discussion of P-T paths and retro-951 gression of the CBU on Sifnos). 952

Exhumation from peak depths was accommodated by well-distributed, ductile coaxial 953 thinning throughout the bulk stack (cf. Bond et al., 2007; Rosenbaum et al., 2002) and 954 resulted in penetrative Eocene-Oligocene blueschist and greenschist facies retrogression, un-955 related to regional Miocene greenschist facies deformation. Velocity vectors across a dipping 956 planar shear zone (i.e. non-downward tapering) can yield simultaneous subduction and re-957 turn flow depending on the balance between down-dip shear traction (Couette flow), and 958 up-dip buoyancy (Poiseulle flow) (Beaumont et al., 2009; Raimbourg et al., 2007; Warren 959 et al., 2008; Xia & Platt, 2017), thus giving rise to the subduction channel. Calculated 960 flow vectors predict that subduction imparts non-coaxial shear strain (e.g., Fig. 13A) and 961 immense strain rate gradients across the shear zone, resulting in heterogeneous distributions 962 of finite strain, as documented in blueschist-eclogite lithologies at Grizzas and Kini. Ex-963 humation vectors are characterized by two opposite shear senses that switch across the axis 964 of maximum exhumation velocity (Gerya et al., 2002; Raimbourg et al., 2007; Xia & Platt, 965 2017). Therefore, in the center of the upward-translating portion of the channel, exhuma-966 tion is slow and kinematics are effectively coaxial, consistent with the rates and distribution of strain during exhumation of the Syros nappes (Fig. 13B,C). 968

Non-coaxial deformation on the eastern and southeastern side of the island can be 969 attributed to proximity to the Vari Detachment, which is thought to have operated as 970 the extensional subduction channel roof (Aravadinou & Xypolias, 2017; Laurent et al., 971 2016; Ring et al., 2020). Compiled metamorphic geochronology and new Rb-Sr ages allow 972 us to calculate exhumation rates of 1.5-5 mm/yr (= 1.5-5 km/Myr) for each underplated 973 nappe. These rates are roughly an order of magnitude slower than subduction for the 974 Hellenides, and are consistent with buoyancy-driven, channelized return flow in a distributed 975 shear zone (Burov et al., 2014; Gerya et al., 2002; Warren et al., 2008). Furthermore, 976

mm/yr exhumation rates are not consistent with fast rates (comparable to subduction rates) 977 predicted for exhumation along deep-reaching, highly-localized detachments in a downward-978 tapering 'extrusion wedge' (e.g., Ring & Reischmann, 2002; Ring et al., 2020), nor with 979 forced return flow and melange-like mixing in a low-viscosity wedge (Cloos, 1982; Gerya 980 et al., 2002). Thus, between  $\sim 50$  and  $\sim 25$  Ma, return flow in the subduction channel 981 accomplished at least 35 km, and potentially as much as 55 km of vertical exhumation from 982 maximum depths to the greenschist facies middle crust ( $\sim 4$  kbar,  $\sim 15$  km), accounting for 983  ${\sim}75\text{-}80\%$  of CBU exhumation. 984

985 On a regional scale, subduction, underplating, and syn-subduction exhumation were fundamental processes during construction of the greater Attic-Cycladic Complex (e.g., 986 Jolivet et al., 2003; Laurent et al., 2017; Lister & Forster, 2016; Ring & Layer, 2003; Ring et 987 al., 2020; Trotet, Jolivet, & Vidal, 2001). CBU rocks on Sifnos have garnet crystallization 988 ages of  $\sim 47-45$  Ma (Dragovic et al., 2012, 2015), comparable to the base of the Syros stack. 989 The Basal Unit exposed on Evia and Samos reached peak conditions at  $\sim 24-22$ Ma (Ring et 990 al., 2001; Ring & Reischmann, 2002; Ring & Layer, 2003), contemporaneous with late stages 991 of syn-subduction greenschist facies exhumation at the base of the CBU on Syros (Fig. 10). 992 The structurally deeper Phyllite-Quartzite Nappe and Plattenkalk unit exposed on Crete 993 experienced HP/LT metamorphism between ~24-20 Ma (Seidel et al., 1982; Thomson et al., 994 1999), which also overlaps with latest stages of greenschist facies exhumation on Syros (Fig. 995 10). Extension and core complex capture that initiated during trench rollback reworked 996 the ACC to its present configuration, and locally reactivated nappe-bounding thrusts as 997 extensional structures (e.g., Vari Detachment on Syros). 998

# 999 10 Conclusions

Structural analysis, metamorphic petrology, and new and compiled geochronology 1000 demonstrate that exhumed HP/LT rocks on Syros Island (Cyclades, Greece) record progres-1001 sive subduction, underplating, and return flow of three separate tectonic slices. Each nappe 1002 records a similar structural and metamorphic history, despite subducting at different times. 1003 Prograde subduction and underplating of each tectonic slice was characterized by asymmet-1004 ric top-to-the-SSW and top-to-the-S shear strain, and was reached at  $\sim$ 53-52 Ma (northern 1005 nappe),  $\sim 50$  Ma? (central nappe) and  $\sim 47-45$  Ma (southern nappe). Prograde deformation 1006 and metamorphism is locally preserved in the northern and central nappes, but the majority 1007 of the island's meta-sedimentary lithologies were retrogressed during syn-orogenic blueschist-1008 to-greenschist facies exhumation. The subduction-to-exhumation transition in each nappe 1009 is marked by systematic kinematic changes: dominant transport directions rotated from 1010 roughly N-S (syn-subduction), to NE (post-underplating, at the subduction-to-exhumation 1011 transition), to E-W (return flow) and the strain geometry switched from asymmetric to coax-1012 ial. Progressive subduction of structurally deeper nappes occurred contemporaneously with 1013 exhumation of structurally higher nappes throughout the Eocene and Oligocene, captur-1014 ing syn-subduction exhumation in the Hellenic subduction channel shear zone. Subduction 1015 channel return flow proceeded at  $\sim 1.5-5$  mm/yr, which is an order of magnitude slower than 1016 subduction, and accounted for  $\sim 80\%$  of the vertical exhumation of the CBU. Continuous 1017 subduction, punctuated underplating, and syn-subduction exhumation appear to be fun-1018 damental processes during construction of the Attic-Cycladic Complex in the Central and 1019 Southern Cyclades. 1020

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1022

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# 1038 Appendix A Geochronology

## 1039

# A1 Rb-Sr Methods and Sample Descriptions

Cm-sized pieces of rock were cut out from hand samples to isolate specific fabrics 1040 corresponding to progressive stages of deformation-metamorphism as outlined in Section 5. 1041 Samples were crushed with a small hammer between sheets of paper, and ground gently 1042 with a mini metal rock crusher to separate mineral aggregates. Samples were sieved and 1043 separated by grain size. Grain size fractions 125-250  $\mu$ m and 250-500 $\mu$ m were frantzed to 1044 separate minerals based on magnetic susceptibility. The first pass was done with strongest 1045 magnetic setting ( $\sim 1.8$  Amperes) to remove all non-magnetics (e.g., quartz). Subsequent 1046 passes were done starting at the lowest setting where minerals started to magnetically sep-1047 arate (typically  $\sim 0.2$ -0.4 A); separates were repeatedly passed through the Frantz at in-1048 crements of  $\sim 0.1-0.2$  A. Magnetic fractions were then cleaned by hand, by either negative 1049 or positive picking of phases of interest, including garnet, glaucophane, epidote, and white 1050 micas (and apatite and chlorite for retrograde fabrics). White mica separates were cleaned 1051 of inclusions by gently smearing them in a mortar and pestle and washing them through 1052 a sieve with ethanol. SY1616 was collected from float blocks at Kini Beach immediately 1053 beneath in-place blueschist-to-eclogite facies cliff faces. The sample is representative of  $D_S$ 1054 in blueschist-eclogite lithologies. The foliation is defined by glaucophane, epidote, phengite, 1055 paragonite, and rutile, with porphyroblasts of garnet and omphacite. Glaucophane, epidote, 1056 omphacite, and phengite define the lineation. A similar rock type is shown in Figure 7A. 1057 The prograde fabric was targeted for geochronology. 1058

<sup>1059</sup> KCS1617 was collected from Azolimnos (approximate location:  $37^{\circ}$  24'43.86"N, 24° <sup>1060</sup> 57'55.42"E). The sample records an older D<sub>S</sub> cleavage cross-cut by the D<sub>T1</sub> upright crenula-<sup>1061</sup> tion. The mineral assemblage includes glaucophane, epidote, quartz, phengite, paragonite, <sup>1062</sup> garnet, rutile, titanite, and oxides. The D<sub>T1</sub> fabric was cut out of the sample using a <sup>1063</sup> diamond-tipped rock saw and targeted for geochronology.

<sup>1064</sup> KCS1621 was collected from the southern side of Delfini Beach (approximate location: <sup>1065</sup>  $37^{\circ}27'14.61"N, 24^{\circ}53'51.23"E$ ). The sample is representative of D<sub>T2</sub>. The foliation is defined <sup>1066</sup> by quartz, phengite, paragonite and the lineation is defined by porphyroblasts of epidote and <sup>1067</sup> actinolite. This sample is interbedded with quartz-rich schists that have a blue amphibole <sup>1068</sup> lineation decimeters to meters above and below. The greenschist-facies fabric was targeted <sup>1069</sup> for geochronology.

SY1402 was collected from Lotos (approximate location: 37°26'36.64"N, 24°53'48.87"E). 1070 The sample is representative of  $D_{T2}$ , during penetrative greenschist-facies deformation and 1071 transposition of older fabrics, and some rocks surpass the ductile-to-brittle transition. The 1072 sample collected for geochronology is a reaction rind at the margin of a brittlely boudinaged 1073 epidote-rich lens, and includes actinolite, chlorite, epidote, phengite, paragonite, and ap-1074 atite. SY1644 was collected from the southern side of Delfini, very close to KCS1621. The 1075 sample is representative of  $D_{T2}$ , as rocks locally surpass the ductile-to-brittle transition. 1076 Minerals collected for geochronology were precipitated within the boudin neck of a brittlely 1077 boudinaged epidote-rich lens including actinolite, epidote, white mica, and calcite. 1078

1079

# A2 Compilation and treatment of previous geochronology on Syros

Figure A1 and Table A2 show a compilation of published metamorphic geochronology 1080 for the island of Syros (through 2019), comprising 185 individual published ages from 16 1081 studies and 5 chronometers. Applying filters discussed in Section 6.2 to the dataset shown 1082 in Figure 3B reduces the compilation from 89 (excludes igneous zircon) to 44 data points, 1083 which are plotted in Figure 10. The refined dataset comprises 65 individual ages (some 1084 presented as weighted means) that include 44 single-grain analyses and 21 isochrons. The 1085 single-grain analyses include 6 <sup>40</sup>Ar/<sup>39</sup>Ar white mica (Rogowitz et al., 2014; Laurent et 1086 al., 2017), 37 <sup>87</sup>Rb/<sup>86</sup>Sr white mica (Cliff et al., 2016), and 1 U-Pb SHRIMP zircon age 1087

Sample ID and Summary	Phases defining the isochron	Initial Sr	Age	Uncertainty	MSWD	u	
SY1616: Kini omphacite-epidote blueschist	paragonite-phengite	0.7032083	53.53	0.17	1		7
	glaucophane-phengite	0.7032228	53.29	0.17	1		7
	omphacite-phengite	0.7032158	53.41	0.17	1		7
	garn et-phengite	0.703212	53.47	0.21	1		0
	epidote-garnet-phengite	0.7032199	53.34	0.15	0.91		ŝ
	epidote-omphacite-phengite	0.7032198	53.34	0.14	0.64		ŝ
	epidote-garnet-omphacite-phengite	0.7032183	53.36	0.14	0.56		4
	glaucophane-omphacite-garnet-phengite	0.7032179	54.37	0.14	0.46		4
	omphacite-paragonite-garnet-phengite	0.7032121	53.47	0.14	0.28		4
	paragonite(x4)-phengite	0.7031964	53.73	0.13	1.4		S
	** ep-glauc-omph-parag-grt ** NO PHENG	0.703221	59.07	8.57	1.7		5
KCS1617: Azolimnos glaucophane-mica blueschist	epidote-phengite	0.7066671	42.14	0.05	-		7
• D	glaucophane-phengite	0.7065696	45.61	0.1	1		0
	paragonite-phengite	0.7065964	45.48	0.05	1		7
	paragonite-phengite	0.7065992	45.47	0.05	0.41		б
	glaucophane-phengite-phengite	0.7065829	45.56	0.61	8.8		3
	epidote-phengite-phengite	0.706643	45.23	0.05	31		ŝ
	** glaucophane-paragonite(x4) ** NO PHENG	0.7066026	43.44	0.76	10		5
	paragonite(x4)-phengite	0.7065951	45.48	0.13	9.4		5
	8 point isochron (all data, except garnet)	0.7066036	45.43	0.04	23		8
KCS1621: Delfini actinolite-mica greenschist	** paragonite-chlorite ** NO PHENG	0.7066492	35.64	0.39	-		7
)	paragonite-chlorite-phengite	0.7066201	37.04	0.015	13		ŝ
	** epidote-chlorite-paragonite ** NO PHENG	0.7066492	35.64	0.39	7.90E-25		ŝ
	epidote-phengite-phengite	0.7067163	36.9	0.03	6.30E-24		б
	epidote-chlorite-phengite(x2)	0.7066195	37.06	0.02	21		4
	epidote-paragonite-phengite(x2)	0.7066498	37.02	0.02	9.8		4
	** epidote-chlorite-paragonite(x3) ** NO PHENG	0.7066471	36.19	0.29	7.9		S
	paragonite(x3)-phengite(x2)	0.7066348	37.05	0.014	16		S
	chlorite-paragonite(x3)-phengite(x2)	0.7066266	37.06	0.013	16		9
	epidote-chlorite-paragonite(x3)-phengite(x2)	0.7066266	37.06	0.013	13		7
	8 point isochron (all data)	0.7065941	36.91	0.013	440		8
SY 1644: Delfini mineralization in epidosite boudin neck	epidote-white mica	0.7066098	36.16	0.03	1		7
-	actinolite-white mica	0.7067006	35.94	0.03	-		7
SY1402: Lotos reaction rim around epidosite pod	apatite-phengite1	0.704965	36.49	0.01	-		7
*	apatite-phengite2	0.704965	35.94	0.01	1		7
	apatite-phengite3	0.704965	33.18	0.011	1		7
	apatite-phengite4	0.704966	29.43	0.014	1		2
Tabla A1. Evoluation the schurtness of Dh Co	to the second	dooo uo		d in tout fou	difformut and	iteration	ب ن د
(assumed) co-genetic phases. MSWD values a	re a reflection of anavtical uncertainty a	ut each samp and the goodr	tess of fit	of all data po	oints on a give	ven isoch	ID SI
therefore, any two-point isochron by definition l	as an MSWD of 1.	0					5

-40-



Figure A1: Compilation of the locations and ages from published metamorphic geochronology (and magmatic ages from Kampos), from references listed in grey box and discussed in Section 2. Samples are projected onto the cross-section line A-A'-A" as shown in Figure 10. Sample locations are coded by color and shape according to citation, and box colors around reported ages correspond to different chronometers. Abbreviations for boxes with notes indicating the sample's micro-structural and/or lithologic context are as follows: DRX = dynamically recrystallized; wm=white mica, ph=phengite, om=omphacite, gl=glaucophane, ep=epidote, act=actinolie, ap=apatite, wr=whole rock.

# Method	Closure Temp	Sample Name and Description	GPS Coordinates^	Location	Age U	ncertainty Notes	Interpretation*	Ref.
1 U-Pb zircon	>750°C	metagabbro		Grizzas	80.2	1.6	magmatic crystallization (protolith)	[1]
3		meta-plagiogranite breccia		Grizzas	52.4	0.8 skeletal rims, low Th/U	HP metamorphism	[1]
4		1081 omphacitite		Kampos belt	78	1	interpreted as HP met, but likely magmatic	[2]
5		4017 plagiogranite in meta-gabbro	37°29.704'N, 024°54.005'E	Kampos belt	77	1 oscillatory zoned zircons	interpreted as HP met, but likely magmatic	[3]
6					76.1	1.2		[3]
7					76.6	1.3		[3]
8					76.6	1.1		[3]
10					/6.9	1.1		[3]
10					76.1	1.2		[3]
12					78	1.1		[3]
				average	76.5	3.3		(* J
13		3148 Jadetite: albite + jadeite: accessories	37°29 362'N 024°54 335'E	Kampos belt blackwall zone	80.3	0.9 oscillatory zoned zircons (likely		[3]
14		titanite, allanite, zircon, white mica, chlorite,		1	78.7	0.9 magmatic, or seafloor		[3]
15		apatite			80.0	0.9 metasomatism)		[3]
16					78.6	0.7		[3]
17					78.2	0.8		[3]
18					80.6	0.8		[3]
20					78.6	0.7		[3]
20					80.7	0.9		[3]
22					79.9	0.7		[3]
23					80.6	0.7		[3]
24					79.8	0.6		[3]
25					77.3	1.4		[3]
26					80.8	0.7		[3]
27					82.9	2.2		[3]
				renorted weighted mean	79.8	0.7		
28		3149 Omnhacitite omnh alb wm tto chi	27020 262%1 024054 225%	Kamnos helt blackwall zona	70.7	0.5		[2]
20		opaques	57 29.502 N, 024 54.555 E	reamptos ben black wan zone	79.9	0.3 magmatic or scaffoor		[3]
30					78.5	0.8 metasomatism)		[3]
31					78.4	0.4		[3]
32					76.7	0.5		[3]
33					79.9	1.0		[3]
34					77.6	1.0		[3]
				average renorted weighted mean	/8./	1.8		
				reported weighted mean	19.0	0.0		
25		2151 Glauconhanita: alauconhana: subordinata	27920 26201 024954 22500	Kampas halt blackwall zona	78.0	0.8		[2]
35		smounts of omph rt ttp zrc all wm bt	37"29.362"N, 024"54.335"E	Kampos ben blackwan zone	78.9	0.8 oscillatory zoned zircons (likely		[3]
37		anound of onput, it, and ite, and whit of			78.9	1.2 metasomatism)		[3]
38					79.1	1.2		[3]
39					82.2	1.3		[3]
40					80.0	0.8		[3]
41					78.4	0.7		[3]
42					79.2	0.7		[3]
43					80.3	0.9		[3]
44				merate	80.6 79.8	3.0		[3]
				reported weighted mean	79.6	0.5		[2]
45		3152-A Chlorite Actinolite Zone: chl, act, rt,	37°29.362'N, 024°54.335'E	Kampos belt blackwall zone	77.5	1.8 oscillatory zoned zircons (likely		[3]
46		zrc, wm, ap			80.4	1.3 magmatic, or seafloor		[3]
47					82.3	2.0 metasomatism)		[3]
48					78.5	1.1		[3]
49					80.4	2.1		[3]
50					77.7	1.4		[3]
57					79.7	0.7		[3]
53					81.3	11		[3]
54					80.0	1.8		[3]
55					78.9	1.1		[3]
56					84.0	3.7		[3]
57					79.9	1.0		[3]
58					81.1	0.8		[3]
				average	80.0	6.2		
50		2152 B Chlorita Antir-lin Zooo	22920 26281 024054 25 555	Kampas halt hllll	26.2	12		[21
59 60		5152-B Chiorae-Acunolite Zone:	57 29.562 N, 024°54.335'E	Kampos pen plackwall zone	/6.2	1.3 oscillatory zoned zircons (likely		[5]
61					01.5 79.5	1.0 magmatic, or seattoor 1.0 metasomatism)		[2]
62					78.4	1.1		[3]
63					76.9	1.3		[3]
64					73.1	0.7		[3]
65					79.6	0.5		[3]
66					79.3	1.3		[3]
67					78.5	0.8		[3]
00				Algeora	78.2	3.2		[2]
				reported weighted mean	79.4	0.4		61
60 Sm/N	600 700*0	06MSV 6E putila bassing1it-		Kini	577	6.2.8 art landate we in the	armet arouth	E41
o9 Sm/Nd garnet 70	000-700 C	14RSV-84 mice-rich aslogite		K IIII Fahrikas	51.1	0.5 8 grt-leacnate-wr isochron 3.2.4 grt-wr isochron	gamer growth	[#] [41
71		14BSY-35D mica-rich eclogite float		Fabrikas	48.1	2.3 bulk; grt-grt-grt-wr isochron	gamet growth	[4]
72		14BSY-35D mica-rich eclogite, float		Fabrikas	47.1	3 rim of garnet, microdrilled; rim-rim-	garnet growth	[4]
		÷ .				rim pwd-matrix isochron		
73		14BSY-38A, eclogite boudin in quartz schist n	atrix	Fabrikas	44.7	1 5 grt-wr isochron	garnet growth	[4]
74		14BSY-37A eclogite, float		Fabrikas	43.6	1.6 5 grt-wr isochron	garnet growth	[4]
75 Lu/Hf garnet	600°C	Ag31: meta-igneous breccia		Grizzas	52.2	0.3 wr-zm-ttn-'leftover'-4grt isochron;	early garnet crystallization (Lu fractionation)	[5]
						table top digestion		

Table A2: Compilation of published metamorphic geochronology for Syros Island. Data are plotted against closure temperature in Figure 3B. References: (1) Tomaschek et al. (2003), (2) Bröcker and Enders (1999), (3) Bröcker and Keasling (2006), (4) Kendall (2016), (5) Lagos et al. (2007)...

76		Ag85: meta-igneous breccia		Grizzas	51.4	0.4 wr-omph-'leftover'-4grt isochron;	early garnet crystallization (Lu fractionation)	[5]
77		Ap21: glaucophane eclogite		Kini	50	table top digestion 2 wr-omph-'leftover'-3grt isochron;	early garnet crystallization (Lu fractionation)	[5]
						table top digestion		
70 DL 6 NAV	50010 1/ 50		N 271 22 501 5 241 54 522		20.7		و الم الله الم الله الله الله الله	10
78 KD-Sr WM 79 & isochrons	~500 C +/- 50	5243 Ph-Chi-Ab-Qz-Ep-Cai-Im-Gr schist 5244 Ph-Chl-Ab-Qz-Ep-Cal-Tm schist	N 37 23.265' E 24° 54.365'	South Central, Posidonia South Central, Posidonia	28.7 20.5	2.4 pn-cal isochron 1.3 ph-ep-ab isochron	systematics and/or (re)crystallization of white mica	[6]
80 81		5246 Ph-Pg-Chl-Ab-Qz-Ep-Cal-Ttn schist 5267 Ph-Chl-Ab-Oz-Cal-Ttn schist	N 37° 23.643' E 24° 54.151' N 37° 27 734' E 24° 53 898'	South Central, Posidonia N. Delfini	25.3	0.9 ph-ep-cal isochron 3.2 ph-cal isochron	during exhumation and greenschist facies	[6]
82		SYR015 Ph-Pg-Chl-Ab-Qz-Ep-Cal-Ttn schist	N 37° 27.497' E 24° 56.767'	N. of Agios Dimitrios	30.8	2.9 ph-par-ep isochron	renogression	[6]
83		5831 Ph-Chl-Ab-Qz-Ep-Cal-Ttn-Act schist	N 37° 28.808' E 24° 54.723'	Syringas (S. of Kampos)	39.2	3.2 ph-ep-ab-cal isochron		[6]
84		1081 Omphacitite		Kampos belt	49.4	0.7 ph-wr isochron	interpretation not provided in text; likely crystallizati	ion [7]
85		1083 Omphacitite		Kampos belt	46.3	0.7 ph-wr isochron	and/or incipient recrystallization	[7]
86		63286 - caleschist, cal-ph-glc-qz-ab		Palos, Diapori	35.2	1 4 fabric-parallel phengites, 1 randomly oriented aggregate, 2 calcite	Purposefully targeted extensional blueschist- and greenschist-facies fabrics. Phengites were microdrill from sneeific microstructures in calc schists and	[8] led
87					37.4	0.8 single phengite	metabasites. Interpreted as "continuous deformation	[8]
88 89					34.4 37.5	0.8 single phengite 1.7 single phengite	)crystallization.	[8]
					36.1	1.6 mean of above 4 grains		1.41
90					26	2.3 randomly oriented phengite		[8]
91		63297 - calcschist, cal-ph-glc-ep-qz-ab		Palos, Diapori	35.6	0.5 4 fabric-parallel phengites, 1 grain at high angle to fabric, 3 calcite		[8]
92					32.2	0.3 single phengite		[8]
93 94					34.6 34.4	1.1 single phengite 0.5 single phengite		[8]
					34.2	1.4 mean of above 4 grains		1.01
95					40.5	<ol> <li>1.1 high angle phengite, wrapped by foliation-parallel phengites</li> </ol>		[8]
96		63300 - caleschist, cal-ph-gle-chl-qz-ab		Palos, Diapori	41.8	2 4 fabric-parallel phengites, 1 calcite		[8]
97					37.1	0.4 single phengite		[8]
98 99					40.5 34.4	0.4 single phengite 0.5 single phengite		[8]
					38.5	3.3 mean of above 4 grains		
100		63287a - calcschist, cal-ph-grt-dol-glc-qtz-ep-		Grammata	52.5	0.8 6 fabric-parallel phengites, 4 calcite		[8]
101		ttn			52.1 46.9	1.1 single phengite 2.3 single phengite		[8]
103					48.6	0.5 single phengite		[8]
104		63287b			50 47.1	2.7 mean of above 4 grains 0.6 single phengite		[8]
105					46.2	1.3 single phengite		[8]
106		63287a			46.7 28.5	0.6 mean of above 2 grains 0.6 single phengite; has fine grained		[8]
						recrystallized phengite next to it		
		S97/234 - greenschist, ab-chl-ph-ep-qz-cal, rare		N. Oros Syringas		4 fabric-parallel phengites + 3 ep; 1 grain from decussate pressure		
		S97/234 - greenschist, ab-chl-ph-ep-qz-cal, rare glc		N. Oros Syringas		4 fabric-parallel phengites + 3 ep; 1 grain from decussate pressure shadow adjacent to garnet		
107 108		S97/234 - greenschist, ab-chl-ph-ep-qz-cal, rare glc		N. Oros Syringas	33.6 29.4	4 fabric-parallel phengites + 3 ep; 1 grain from decussate pressure shadow adjacent to garnet 0.4 pseudomorph 2.3 single phengite		[8]
107 108 109		S97/234 - greenschist, ab-chl-ph-ep-qz-cal, rare gle		N. Oros Syringas	33.6 29.4 34	4 fabric-parallel phengites + 3 ep; 1 grain from decussate pressure shadow adjacent to garnet 0.4 pseudomorph 2.3 single phengite 0.5 single phengite		[8] [8] [8]
107 108 109 110		S97/234 - greenschist, ab-chl-ph-ep-qz-cal, rare gle		N. Oros Syringas	33.6 29.4 34 33.9 23	4 fabric-parallel phengites + 3 ep; 1 grain from decussate pressure shadow adjacent to garnet 0.4 pseudomorph 2.3 single phengite 0.5 single phengite 1.8 weghted mean of above 3 grains 1.1 decussate phengite		[8] [8] [8]
107 108 109 110		S97/234 - greenschist, ab-chl-ph-qp-qz-cal, rare gle		N. Oros Syringas	33.6 29.4 34 33.9 23	4 fabric-parallel phengitts + 3 epc 1 grain from decussate pressure shadow adjacento gamet 0.4 precadomorph 2.3 single phengite 0.5 single phengite 1.8 weghte dmean of above 3 grains 1.1 decussate phengite 0.5 discussed phengite		[8] [8] [8]
107 108 109 110		S97/234 - greenschist, ab-chl-ph-qp-qz-cal, rare gle 63301 - greenschist, qz-ph-chl-ab-cal-dol-tm-ap- P8		N. Oros Syringas Foinikia	33.6 29.4 34 <b>33.9</b> 23 30.1	4 fibrici-parallel phengines + 3 cp; 1 grain from decussate pressure shadow adjacent to garnet 0.4 pseudomorph 2.3 single phengine 0.3 single phengine 1.8 weighted mean of above 3 grains 1.1 decussate phengine 0.7 decussate/radiating factore at high angle to fadiating factore at high angle to fadiating factore at high		[8] [8] [8] [8]
107 108 109 110 111		897/234 - greenschist, ab-chl-ph-ep-qz-cal, rare gle 63301 - greenschist, qz-ph-chl-ab-cal-dol-tm-ap- Pg		N. Oros Syringas Foinikia	33.6 29.4 34 <b>33.9</b> 23 30.1 33.7	4 fabric-parallel phengines + 3 erg. grain from decussate pressure shadow adjacent to garnet 04 pseudomorph 23 single phengine 05 single phengine 13 weighted mean of above 3 grains 11 decussate phengine 0.7 decussate/radiating cheater at high angle to fabric: phas 2 cal + 2 can 0.6 composite fabric-garatil sample		[8] [8] [8] [8] [8]
107 108 109 110 111		897/234 - greenschist, ab-chl-ph-ep-qz-cal, rare gle 63301 - greenschist, qz-ph-chl-ab-cal-dol-tm-ap- Pg 63310 - blueschist, qz-gle-ph-cal-qz-ab-tm-tour-		N. Oros Syringas Foinikia Deffni	33.6 29.4 34 <b>33.9</b> 23 30.1 33.7	4 fabric-parallel (hengines - 3 arg. 1 grain from decussule pressure shadow adjacent to garnet 0.4 pseudomosta 0.5 single phengine 0.5 single phengine 1.1 decussate phengine 1.1 decussate phengine 0.7 decussate/adlating cluster at high angle to fabric: phus 2 cal + 2 tm 0.6 decussed/adlating cluster at high angle to fabric: phus 2 cal + 2 tm 0.6 composite fabric-parallel samples		[8] [8] [8] [8] [8]
107 108 109 110 111 112 113 114		S97/234 - greenschist, ab-chl-ph-ep-qz-cal, rare gle 63301 - greenschist, qz-ph-chl-ab-cal-dol-tm-ap- Pg 63310 - blueschist, qz-ph-chl-ab-cal-dol-tm-ap- Pg		N. Oros Syringas Foinikia Delfini	33.6 29.4 34 33.9 23 30.1 33.7 31.3 29.5	4 fabric-penallel phengines - 3 cyr. 1 grain from deussude pressure shadow adjacent to gamet 04 pseudomorph 23 single phengine 05 single phengine 14 weighted mean of above 3 grains 1.1 decussate phengine 0.7 decussate/radating cluster at high angle to fabric: psus 2 cal + 2 tm 0.6 composite fabric: parallel sample 2 phengine composite samples 04 aligned with schitosity; 3 cp + 2 cal 1.2 composite d <sup>2</sup>		[8] [8] [8] [8] [8] [8]
107 108 109 110 111 112 113 114		<ul> <li>S97/234 - greenschist, ab-chl-ph-ep-qz-cal, rare gle</li> <li>63301 - greenschist, qz-ph-chl-ab-cal-dol-tm-ap-pg</li> <li>63310 - blueschist, qz-gle-ph-cal-qz-ab-tm-tour-chl</li> <li>63214 - blueschist, ep-gle-ph-cal-qz-ab-th-tour-chl</li> </ul>		N. Oros Syringas Foinikia Delfini	33.6 29.4 34 33.9 23 30.1 33.7 31.3 29.5	4 fabric-penallel phengines - 3 cp. 1 grain from decussule pressure shahow adjacent to garnet 0 de pseudomostr 2 3 single phengine 0 single phengine 1 decussate phengine 1 decussate phengine 0 decussate adhengine 0 decussate adhengine 0 decussate adhengine 2 phengine composite administratile sample 0 de adjaced with schittensity 3 op + 2 cal 1 2 composite #2 1 Stefan encolled hengine 1 anishes		[8] [8] [8] [8] [8] [8] [8]
107 108 109 110 111 112 113 114 115		S97224 - greenschist, ab-chl-ph-ep-qz-cal, rare gle 63301 - greenschist, qz-ph-chl-ab-cal-dol-tm-ap- p8 63310 - blueschist, qp-gle-ph-cal-qz-ab-tm-tour- chl 63314 - blueschist, ph-gle-qz-ep-tm-chl-ab-cal- ap		N. Oros Syringas Foinikia Delfini	33.6 29.4 34 33.9 23 30.1 33.7 31.3 29.5 34	4 fibrici-parallel phengines - 3 cp. 1 grain from decussate pressure shudow adjacent to gamet O spesichometer 2.5 single phengite 3.8 weghter them of above 3 grains 1.1 decussate phengite 0.7 decussate phengite 0.7 decussate phengite 2.8 phengite composite samples 0.6 composite fabric-parallel sample 2.8 phengite composite samples 0.6 adjagred with schestosity; 3 cp + 2 cal 1.2 composite #2 1.7.8 fibric-parallel phengites, 1 epidets, 1 apatie, 2 micksions		[8] [8] [8] [8] [8] [8] [8]
107 108 109 110 111 112 113 114 115 116		897/234 - greenschist, ab-chl-ph-ep-qz-cal, rare gle 63301 - greenschist, qz-ph-chl-ab-cal-dol-tm-ap- P8 63310 - blueschist, qp-gle-ph-cal-qz-ab-tm-tour- chl 63314 - blueschist, ph-gle-qz-qz-tm-chl-ab-cal- ap		N. Oros Syringas Foinikia Delfini	33.6 29.4 34 33.9 23 30.1 33.7 31.3 29.5 34 39.5 34	4 fabric-parallel phengines - 3 app. grain from decusset pressure shadow adjacent to gramet 04 pseudomorph 23 single phengine 13 weighted mean of above 3 grains 14 decussate phengine 0.7 decussate/radiating cluster at high angle to fabric: plus 2 cal + 2 tan 0.6 composite fabric-sparalle sample 0.4 adjagned with schintosity; 3 op + 2 cal 1.2 composite ne <sup>2</sup> 1.7 8 fabric-parallel phengines, 1 epidote, 1 againe, 2 tan, loss of cap inclusions 31 single phengine		[8] [8] [8] [8] [8] [8] [8] [8] [8]
107 108 109 110 111 112 113 114 115 116 117 118		897/234 - greenschist, ab-chl-ph-ep-qz-cal, rare gle 63301 - greenschist, qz-ph-chl-ab-cal-dol-tm-ap- pg 63310 - blueschist, qz-gle-ph-cal-qz-ab-tm-tour- chl 63314 - blueschist, ph-gle-qz-ep-tm-chl-ab-cal- ap		N. Oros Syringas Foinikia Delfini	33.6 29.4 34 33.9 23 30.1 33.7 31.3 29.5 34 39.5 33.9 36.3	<ul> <li>4 fabric-parallel phengines - 3 arg.</li> <li>a grain from decussule pressure shadow adjacent to granet</li> <li>0 4 precidenorsph to granet</li> <li>0 5 single phengine</li> <li>1 8 weghted mean of above 3 grains</li> <li>1.1 decussate/salating cluster at high angle to fabric: phus 2 cal + 2 tn</li> <li>0.0 decussate/salating cluster at high angle to fabric: pravalle samples</li> <li>0 4 adjagred with schittority; 3 cp + 2 cal</li> <li>1 2 composite labric; th</li> <li>1 2 composite labric;</li> <li>1 2 composite labric;</li> <li>1 3 single phengine</li> <li>1 3 single phengine</li> <li>1 3 single phengine</li> </ul>		[8] [8] [8] [8] [8] [8] [8] [8] [8] [8]
107 108 109 110 111 112 113 114 115 116 117 118 116 117 118 119 129		S97/234 - greenschist, ab-chl-ph-ep-qz-cal, rare gle 63301 - greenschist, qz-ph-chl-ab-cal-dol-tm-ap- pg 63310 - blueschist, qz-gle-ph-cal-qz-ab-tm-tour- chl 63314 - blueschist, ph-gle-qz-ep-tm-chl-ab-cal- ap		N. Oros Syringas Foinikia Delfini Delfini	33.6 29.4 33.9 23 30.1 33.7 31.3 29.5 34 39.5 33.9 34.3 31.7	4 fibric-parallel phengines - 3 cp. 1 grain from decussule pressure shahow adjacent to gumet 0 Ap sexidomorph 2 3 single phengine 0 5 single phengine 1 decusate phengine 0 decusate phengine 1 generative parallel sample 0 de aligned with schittosity; 3 cp + 2 cal 1 2 single phengine 1 3 single phengine		[8] [8] [8] [8] [8] [8] [8] [8] [8] [8]
107 108 109 110 111 112 113 114 115 116 117 117 118 119 120		<ul> <li>S97.234 - greenschist, ab-chl-ph-ep-qz-cal, rare gle</li> <li>63301 - greenschist, qz-ph-chl-ab-cal-dol-thr-ap-pg</li> <li>63310 - blueschist, qp-gle-ph-cal-qz-ab-thr-tour-chl</li> <li>63314 - blueschist, ph-gle-qz-ep-th-chl-ab-cal-ap</li> </ul>		N. Oros Syringas Foinikin Delfini	33.6 29.4 34 33.9 23 30.1 33.7 34.3 35.5 34.3 34.3 34.3 34.3 34.3 34.3	4 fabric-parallel phengines + 3 epc 1 grain from decussate pressure shadow adjacent to gramet 04 pseudomorph 23 single phengine 05 single phengine 14 decussate/radiating cheater at high angle to fabric: phus 2 cal + 2 mi 0.6 composite holdrive-grantal source 0.6 decussate/radiating cheater at high angle to fabric: phus 2 cal + 2 mi 0.6 composite fabric-grantal source 0.4 sligned with echitostaty 3 ep + 2 cal 1.2 composite in echitostaty 3 ep + 2 cal 1.2 composite fabric-grantal sources 1.3 fabric-parallel phengines. 1 epidote. 1 apatite 2, thu, loss of ep inclusions 3.1 single phengine 1.3 ringle phengine 1.4 ringle phengine	doe	[8] [8] [8] [8] [8] [8] [8] [8] [8] [8]
107 108 109 110 111 112 113 114 115 116 117 117 117 119 119 120 121		897/234 - greenschist, ab-chl-ph-ep-qz-cal, rare gle 63301 - greenschist, qz-ph-chl-ab-cal-dol-tm-ap- P8 63310 - blueschist, qp-glc-ph-cal-qz-ab-tm-tour- chl 63314 - blueschist, ph-glc-qz-ep-tm-chl-ab-cal- ap		N. Oros Syringas Foinikia Delfini	33,6 29,4 33,9 23 30,1 31,3 29,5 34 39,5 33,9 34 34 34 34 34 37 37 39,7 29,7 29,7	4 fabric-parallel phengines - 3 eye 1 grain from decusste pressure shadow adjacent to gramet 04 pseudomorph 23 single phengine 05 single phengine 14 weighted mean of above 3 grains 11 decussate phengine 0.7 decussate/radiating cluster at high angle to fabric: phus 2 cal + 2 tm 0.6 composite fabric-sparalle samples 0.4 adjuged with schitosity; 3 ep + 2 cal 12 composite #2 11.7 8 fabric-parallel phengites, 1 epidote, 13 single phengite 13 single phengite	dore	[8] [8] [8] [8] [8] [8] [8] [8] [8] [8]
107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122		897/234 - greenschist, ab-chl-ph-ep-qz-cal, rare gle 63301 - greenschist, qz-ph-chl-ab-cal-dol-tm-ap- Pg 63310 - blueschist, qz-glc-ph-cal-qz-ab-tm-tour- chl 63314 - blueschist, ph-glc-qz-cp-tm-chl-ab-cal- ap		N. Oros Syringas Foinikia Delfini	33.6 29.4 33.9 23 30.1 33.7 34.3 39.5 34.3 39.5 36.3 36.3 33.7 34.3 31.7 29.7 29.2 29.4	4 fabric-parallel phengines - 3 arg.     grain from decussue pressure     shadow adjacent to gramet     04 pseudomorph     23 single phengine     13 single phengine     14 weighted mean of above 3 grains     11 decussate/adjating cluster at high     angle to fabric: psus 2 cluster     2 phengite composite samples     0.4 adjacent or gramples     0.4 adjacent or gramples     0.4 adjacent with schetting; 2 cluster     2 phengite composite samples     0.4 adjacent with schetting; 3 cp + 2 cal     12 composite #2     17 8 fabric-parallel phengites     13 single phengite     14 single pheng	dote	[8] [8] [8] [8] [8] [8] [8] [8] [8] [8]
107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122		S97/234 - greenschist, ab-chl-ph-ep-qz-cal, rare gle 63301 - greenschist, qz-ph-chl-ab-cal-dol-tm-ap- Pg 63310 - blueschist, qz-gle-ph-cal-qz-ab-tm-tour- chl 63314 - blueschist, ph-gle-qz-ep-tm-chl-ab-cal- ap	GPS points approximated from	N. Oros Syringas Foinikia Delfini Delfini	33.6 29.4 33.9 23 30.1 33.7 34 39.5 36.9 34 39.5 36.9 36.3 34.3 34.3 34.3 34.7 29.2 29.4	<ul> <li>4 fabric-parallel phengines - 3 erg.</li> <li>4 grain from decussule pressure shadow adjacent to granet</li> <li>0 4 precidenomych og granet</li> <li>0 5 single phengine</li> <li>1 8 weghted mean of above 3 grains</li> <li>1.1 decussate/salating cluster at high angle to fabric: phus 2 cli + 2 th</li> <li>0.6 decussate/salating cluster at high angle to fabric: phus 2 cli + 2 th</li> <li>0.6 decussate/salating cluster at high angle to fabric: phus 2 cli + 2 th</li> <li>0.7 decussate/salating cluster at high angle to fabric: phus 2 cli + 2 th</li> <li>1.7 8 fabric-parallel phengite</li> <li>1.2 composite it<sup>2</sup></li> <li>1.7 8 fabric-parallel phengites, 1 epidote, 1 a patite, 2 th, loss of ep inclusions</li> <li>3.1 single phengite</li> <li>1.3 single phengite</li> <li>1.3 single phengite</li> <li>1.3 single phengite</li> <li>0.5 single phengite</li> <li>0.5 single phengite</li> <li>0.7 single phengite</li> <li>0.7 single phengite</li> <li>0.5 single phengite</li> </ul>	dote	(8) (8) (8) (8) (8) (8) (8) (8) (8) (8)
107 108 109 110 111 112 113 114 115 116 117 117 118 120 121 122 123		<ul> <li>S97.234 - grcenschist, ab-chl-ph-ep-qz-cal, rare gle</li> <li>63301 - grcenschist, qz-ph-chl-ab-cal-dol-tm-ap-p8</li> <li>63310 - blueschist, qp-gle-ph-cal-qz-ab-tm-tour-chl</li> <li>63314 - blueschist, ph-gle-qz-ep-tm-chl-ab-cal-ap</li> <li>15-SY-03 gluncophane eclogite</li> <li>15-SY-05 gluncophane eclogite</li> </ul>	GPS points approximated from 37°2320.99°N 24°5713.35°I	N. Oros Syringas Foinikia Delfini Delfini tamp, not provided in text Fabrikas	33.6 29.4 33.9 30.1 33.7 34 39.5 34 39.5 34.3 34.3 34.3 34.7 29.7 20.2 29.4 39.6 34.6	4 fabric-parallel phengines - 3 cp. 1 grain from decussate pressure shadow adjacent to grarnet 0 4 pseudomorph 2 3 single phengine 3 5 single phengine 1 4 decussate phengine 0.7 decussate/radiating chester at high angle to fabric: phas 2 cal + 2 cm 0.6 composite holpris-grantal's analysis 2 phengine composite samples 0 4 adigord with schistosity; 3 cp + 2 cal 1 2 composite #2 1.7 8 fabric-parallel phengine 1 3 single phengine 0 4 singer of and a fabric single single 1 3 single phengine 1 3 single phengine 0 5 single	dote Interpreted as peak metamorphism, but probably 'reworksef' during echamation	<ul> <li>[8]</li> <li>[9]</li> <li>[9]</li> </ul>
107 108 109 110 111 112 113 114 115 116 117 118 120 121 121 122 123 124 125 125		<ul> <li>S97.234 - grcenschist, ab-chl-ph-ep-qz-cal, rare gle</li> <li>63301 - grcenschist, qz-ph-chl-ab-cal-dol-thr-ap-pg</li> <li>63310 - blueschist, qp-gle-ph-cal-qz-ab-thr-tour-chl</li> <li>63314 - blueschist, ph-gle-qz-ep-thr-chl-ab-cal-qp</li> <li>15-SY-63 glaacophane eclogite</li> <li>15-SY-63 glaacophane eclogite</li> <li>15-SY-63 glaacophane eclogite</li> <li>15-SY-63 glaacophane eclogite</li> </ul>	GPS points approximated from 37°2320.99°N 24°5713.35° 37°2317.66°N 24°579.50°E	N. Oros Syringas Foinikia Delfini Delfini Fibrikas Fabrikas Fabrikas	33,6 29,4 33,9 23 30,1 33,7 34 39,5 34 39,5 34 39,5 34,3 34,3 29,7 29,7 29,4 39,6 41,6 41,56	4 fabric-parallel phengines + 3 ey. 1     grain from decusste pressure     shadow adjacent to granet     0.4 pseudomorph     2.3 single phengine     1.3 weighted mean of above 3 grains     1.4 decusste phengine     1.4 decusste phengine     0.7 decussate/radiating cluster at high     angle to fabric: phas 2 cal + 2 tm     2 phengite composite samples     0.6 composite horiz-grantles atmples     0.6 composite fabric-grantles atmples     2 phengite composite samples     2 phengite composite samples     1.2 decussate/radiating cluster at high     angle to fabric-grantles atmples     2 phengite composite samples     1.2 composite 12     1.7.8 fabric-parallel phengites. 1 quictote,     1 aptite, 2 th, loss of ep inclusions     3.1 single phengite     1.2 single phengite     1.2 single phengite     1.3 single phengite     1.3 single phengite     1.3 single phengite     1.5 single phengite     1.6 single ph	dote Interpreted as peak metamorphism, but probably Yew wicked during exhamation	(8) (8) (8) (8) (8) (8) (8) (8) (8) (8)
107 108 109 110 111 112 113 114 115 116 117 117 118 120 121 121 122 123 124 125 125 126		<ul> <li>S97/234 - grcenschist, ab-chl-ph-ep-qz-cal, rare gle</li> <li>63301 - grcenschist, qz-ph-chl-ab-cal-dol-tm-ap-pg</li> <li>63310 - blueschist, qp-gle-ph-cal-qz-ab-tm-tour-chl</li> <li>63314 - blueschist, ph-gle-qz-qp-tm-chl-ab-cal-ap</li> <li>15-SY-403 glaucophane celogite</li> <li>15-SY-404 glaucophane celogite</li> <li>15-SY-405 glaucophane celogite</li></ul>	GPS points approximated from 37°2320.99°N 24°5713.35° 37°2317.66°N 24°579.50°E	N. Oros Syringas Foinikia Delfini Delfini Fibrikas Fabrikas Fabrikas Fabrikas	33.6 29.4 33.9 23 30.1 33.7 34 39.5 34 39.5 34 39.5 34 39.5 34 39.7 29.7 29.4 39.6 41.6 41.36 26.9	4 fabric-parallel phengines - 3 erg.     grani from decusseite pressure     shadow adjacent to grannet     0.4 pseudomorph     23 single phengine     13 single phengine     1.4 weighted mean of above 3 grains     1.4 decussate phengine     0.7 decussate/radiating cluster at high     angle to fabric: phas 2 cal + 2 tm     0.6 composite horbity: 3 cal + 2 tm     0.6 composite horbity: a cal + 2 tm     0.6 composite horbity: a cal + 2 tm     1.2 decussate/radiating cluster at high     angle to fabric: phas 2 cal + 2 tm     0.6 composite horbity: a cal + 2 tm     1.2 decussate/radiating cluster at high     angle to fabric: phas 2 cal + 2 tm     1.2 composite     1.2 decussate/radiating cluster at high     angle to fabric-sparallel phengine     1.2 composite angles     1.3 single-phengine     1.2 ringle-phengine     1.2 ringle-phengine     0.5 ringle-phengine     0.7 ringle-phengine     0.7 ringle-phengine     0.7 single-phengine     0.7 single-phengin	dote Interpreted as peak metamorphism, but probably 'reworked' during echumation greenschist teerystallization	(8) (8) (8) (8) (8) (8) (8) (8) (8) (8)
107 108 109 110 111 112 113 114 115 116 117 117 118 119 120 121 122 123 124 125 125 126		<ul> <li>S97.234 - grcenschist, ab-chl-ph-ep-qz-cal, rare gle</li> <li>63301 - grcenschist, qz-ph-chl-ab-cal-dol-tm-ap-pg</li> <li>63310 - blueschist, qp-gle-ph-cal-qz-ab-tm-tour-chl</li> <li>63314 - blueschist, ph-gle-qz-ep-tm-chl-ab-cal-ap</li> <li>15-SY-03 glancophane celogite</li> <li>15-SY-03 glancophane celogite</li> <li>15-SY -03 glancophane celogite</li> <li>15-SY -03 glancophane telogite</li> <li>15-SY -03 glancophane telogite</li> <li>15-SY -03 glancophane telogite</li> <li>17-FB 05 grcenschist</li> </ul>	GPS points approximated from 37°2320.99°N 24°57°13.35° 37°23'17.66°N 24°579.50°E	N. Oros Syringas Foinikia Delfini Delfini Eiderikas Fabrikas Fabrikas Fabrikas	33,6 29,4 33,9 30,1 31,3 29,5 34 39,5 34 39,5 33,9 34,3 34,3 34,3 34,3 34,3 34,3 34,3	A fabric-parallel phengines - 3 eye 1 grain from decusste pressure shadow adjacent to gramet 0 4 pseudomorph 2 3 single phengine 3 5 single phengine 1 4 weighted mean of above 3 grains 1 1 decussate phengine 0.7 decussate/radiating cluster at high angle to fabric: phus 2 cal + 2 tm 0.6 composite holter-jearallel sample 0.6 composite fabric-grantell sample 0.6 composite fabric-grantell sample 0.3 single phengine 1 2 single phengine 1 2 single phengine 1 3 single phengine 0.6 single phengine 0.7 single phengine 0.7 single phengine 0.7 single phengine 0.7 single phengine 0.5 single phengine 0.3 single phengine 0.3 single phengine 0.4 single single phengine 0.5 single phengine 0.5 single phengine 0.4 single single single single single single 0.5 single phengine 0.5 single phengine 0.5 single phengine 0.4 single sing	dote Interpreted as peak metamorphism, but probably 'reworked' during exhumation greenschist recrystallization	(8) (8) (8) (8) (8) (8) (8) (8) (8) (8)
107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 At/Ar WM	-400-450°C 550°C (Ref. 11)	<ul> <li>S97.234 - grcenschist, ab-chl-ph-ep-qz-cal, rare gle</li> <li>63301 - grcenschist, qz-ph-chl-ab-cal-dol-tm-ap-pg</li> <li>63310 - blueschist, qp-glc-ph-cal-qz-ab-tm-tour-chl</li> <li>63314 - blueschist, ph-glc-qz-qp-tm-chl-ab-cal-ap</li> <li>15-SY-0.3 glancophane eclogite</li> <li>15-SY-0.4 gladoc blueschist</li> <li>17 FB 05 grcenschist</li> <li>AG144 and BSY260 meta-plagiogranite dyke &amp;</li> </ul>	GPS points approximated from 37"2320.99"N 24"5713.35" 37"23'1.66"N 24"579.50"E breecia	N. Oros Syringas Foinikia Delfini Delfini Delfini Etabetkas Faberkas Faberkas	33,6 29,4 33,9 23 30,1 31,3 29,5 34 39,5 33,9 34 39,5 33,9 34 39,5 33,9 34 39,5 33,9 34 39,5 34 39,7 29,2 29,4 39,6 41,6 41,6 41,6 41,6 41,6 41,6 41,6 41	A fabric-parallel phengines - 3 erg. 1 grain from decusste pressure shadow adjacent to granet 0.4 pseudomorph 2.5 single phengine 1.5 single phengine 1.6 accusster/aduting cluster at high angle to fabric: phus 2 cluster 1.6 decusster/aduting cluster at high angle to fabric: phus 2 cluster 2 phengine composite samples 0.4 decusster/aduting cluster at high angle to fabric: phus 2 cluster 2 phengine composite samples 0.4 adigned with schittstisty; 3 ep + 2 call 1.2 composite in 2 1.7 8 fabric-parallel phengines, 1 epidote, 1 apatite. 2 tu, loss of ep inclusions 3.1 single phengine 1.3 single phengine 1.3 single phengine 1.3 regression of above sit grains w. epi 0.7 single phengine 0.7 single phengine 0.7 single phengine 0.5 weighted mean of youngest grains 1.2 4wn-omph-glanec-ep isochron 0.45 4wm-glanec-epa isochron 0.4 4wm-act-ap isochron 0.4 4wm-act-ap isochron 0.4 4wm-act-ap isochron 0.4 4wm-act-ap isochron 0.5 4wm-act-ap isochro	dote Interpreted as peak metamorphism, but probably 'reworked' during exhamation greenschist recrystallization	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 126 129	-400-459°C 559°C (Ref. 11)	897/234 - greenschist, ab-chl-ph-ep-qz-cal, rare gle 63301 - greenschist, qz-ph-chl-ab-cal-dol-tm-ap- pg 63310 - blueschist, qz-gle-ph-cal-qz-ab-tm-tour- chl 63314 - blueschist, ph-gle-qz-cp-tm-chl-ab-cal- ap 15-SY-03 gluecophane cologite 15-SY-05 gluecophane cologite 15-SY-04 gluecophane cologite 15-SY-04 gluecophane cologite 15-SY-04 gluecophane cologite 15-SY-04 gluecophane cologite 15-SY-04 greenschist 17 FB 05 greenschist	GPS points approximated from 37°23'20.99°N 24°5713.35°I 37°23'17.66°N 24°579.50°E breccia	N. Oros Syringas Foinikia Delfini Delfini Delfini Fabrikas Fabrikas Fabrikas Grizzas North of Delfini	33.6 29.4 33.9 23 30.1 33.7 34.3 39.5 33.9 34.3 33.7 34.3 29.7 29.7 29.7 29.4 41.6 41.6 41.6 41.6 41.6 26.9	4 fibric-parallel phengins - 3 erg. grain from decussie pressure shadow adjacent to gramet 0.4 pseudomorph 2.3 single phengine 1.3 weighted mean of above 3 grains 1.1 decassie/adiating cluster at high angle to fabric: phus 2 cul + 2 tm 0.6 composite fabric: parallel sample 0.6 composite fabric: parallel sample 1.2 angle to fabric: phus 2 cul + 2 tm 0.6 composite fabric: parallel samples 0.4 aligned with schistosity; 3 ep + 2 cul 1.2 composite and 1.2 composite and 1.2 composite and 1.3 single phengite 1.3 single phengite 1.4 single phengite 1.5 single	dote Interpreted as peak metamorphism, but probably 'reworked' during echumation greenschist recrystallization 'prograde crystallization? prograde crystallization?	8) 8] 8] 8] 8] 8] 8] 8] 8] 8] 8]
107 108 109 110 111 112 113 114 115 116 117 118 117 118 119 120 121 122 123 124 125 124 125 124 125 126 127 <b>At/Ar WM</b>	-400-450°C 550°C (Ref. 11)	<ul> <li>S97.234 - greenschist, ab-ehl-ph-ep-qz-cal, rare gle</li> <li>63301 - greenschist, qz-ph-ehl-ab-cal-dol-tm-ap- P8</li> <li>63310 - blueschist, qp-gle-ph-cal-qz-ab-tm-tour- chl</li> <li>63314 - blueschist, ph-gle-qz-ep-tm-ehl-ab-cal- ap</li> <li>15-SY-03 glaucophane eelogite</li> <li>15-SY-05 glaucophane eelogite</li> <l< td=""><td>GPS points approximated from 37°23'20.99"N 24°5713.35"1 37°23'17.66"N 24°579.50"E breecia</td><td>N. Oros Syringas Foinikin Delfini Delfini Interpretation of the second s</td><td>33.6 29.4 33.3 30.1 33.7 34 39.5 34 39.5 33.9 36.3 34.3 34.3 34.2 29.7 29.4 29.4 29.4 29.4 29.4 29.4 29.4 29.4</td><td>4 fabric-parallel phengines + 3 ep. 1 grain from decussate pressure shadow adjacent to gramet 0 4 pseudomorph 2 3 single phengine 3 5 single phengine 1 3 weighted mean of above 3 grains 1 1 decussate phengine 0.7 decussate/radiating cheater at high angle to fabric: phus 2 cal + 2 cm 0.6 composite holpric-granults and 0.6 composite fabric-granults and 0.6 single the holpric granults and 0.4 sligged with schittscing - 3 ep. 2 cal 1 2 composite #2 1.7 # fabric-parallel phengine 1 2 single phengine 1 3 single phengine 1 3 single phengine 1 3 single phengine 0 5 single phengine 0 5 single phengine 0 5 single phengine 0 3 single phengine 0 4 www.enpha.ex-p-ap isochron 0.44 www.enpha.ex-p-ap isochron 0.54 M a</td><td>dote Interpreted as peak metamorphism, but probably reworked" during exhamation greenschist recrystallization prograde crystallization? prograde? (partial) reservating and/or recrystallization</td><td>[8]         [8]           [8]         [8]           [8]         [8]           [8]         [8]           [8]         [8]           [8]         [8]           [9]         [9]           [10]         [10]</td></l<></ul>	GPS points approximated from 37°23'20.99"N 24°5713.35"1 37°23'17.66"N 24°579.50"E breecia	N. Oros Syringas Foinikin Delfini Delfini Interpretation of the second s	33.6 29.4 33.3 30.1 33.7 34 39.5 34 39.5 33.9 36.3 34.3 34.3 34.2 29.7 29.4 29.4 29.4 29.4 29.4 29.4 29.4 29.4	4 fabric-parallel phengines + 3 ep. 1 grain from decussate pressure shadow adjacent to gramet 0 4 pseudomorph 2 3 single phengine 3 5 single phengine 1 3 weighted mean of above 3 grains 1 1 decussate phengine 0.7 decussate/radiating cheater at high angle to fabric: phus 2 cal + 2 cm 0.6 composite holpric-granults and 0.6 composite fabric-granults and 0.6 single the holpric granults and 0.4 sligged with schittscing - 3 ep. 2 cal 1 2 composite #2 1.7 # fabric-parallel phengine 1 2 single phengine 1 3 single phengine 1 3 single phengine 1 3 single phengine 0 5 single phengine 0 5 single phengine 0 5 single phengine 0 3 single phengine 0 4 www.enpha.ex-p-ap isochron 0.44 www.enpha.ex-p-ap isochron 0.54 M a	dote Interpreted as peak metamorphism, but probably reworked" during exhamation greenschist recrystallization prograde crystallization? prograde? (partial) reservating and/or recrystallization	[8]         [8]           [8]         [8]           [8]         [8]           [8]         [8]           [8]         [8]           [8]         [8]           [9]         [9]           [10]         [10]
107 108 109 110 111 112 113 114 115 116 117 118 121 121 122 123 124 125 126 125 126 127 <b>Ar/Ar WM</b> 128 130 131 132	-400-450°C 550°C (Ref. 11)	<ul> <li>S97.234 - grcenschist, ab-chl-ph-ep-qz-cal, rare gle</li> <li>63301 - grcenschist, qz-ph-chl-ab-cal-dol-tm-ap-Pg</li> <li>63310 - blueschist, qp-gle-ph-cal-qz-ab-tm-tour-chl</li> <li>63314 - blueschist, ph-gle-qz-ep-tm-chl-ab-cal-qp</li> <li>15-SY-03 glaacophane celogite</li> <li>15-SY -03 glaacophane celogite</li> <li>15-SY -04 glaacophane celogite</li> <li>15-SY -05 glaacophane celogite</li> <li>15-SY -05 glaacophane celogite</li> <li>15-SY -05 glaacophane celogite</li> <li>15-SY -05 glaacophane celogite</li> <li>15-SY -01 quadrate metaphyte</li> </ul>	GPS points approximated from 37°23'20.99°N 24°5713.35° 37°23'17.66°N 24°579.50°E breecia	N. Oros Syringas Foinikia Delfini Delfini Unap, not provided in text Fabrikas Fabrikas Fabrikas Grizzas Grizzas North of Delfini North of Delfini North of Delfinis W. Kampos beti	33,6 29,4 33,9 23 30,1 33,7 34 39,5 34 39,5 34 39,5 34 39,5 34 39,5 34,3 34,3 29,7 29,4 39,6 41,5 26,9 52,3 52,3 53,5 54,5 40,2 30,3 31,5 20,5 31,5 34 39,5 34 34,5 34,5 34,5 34,5 34,5 34,5 34,5	A fabric-parallel phengines - 3 eye 1 grain from decussate pressure shadow adjacent to gramet O a pseudomorph 2.3 single phengine D.5 single phengine D.5 single phengine D.6 sequestion phengine D.7 decussate/radiating cluster at high angle to fabric: phus 2 cul + 2 tm D.6 composite helphrisperatil D.6 composite helphrisperatil D.6 composite helphrisperatil D.6 composite laber/sparallel phengine D.1 decussate/radiating cluster at high angle to fabric: phus 2 cul + 2 tm D.6 composite helphrisperatil D.6 composite laber/sparallel phengine D.1 angle phengine D.1 single phengine D.5 migle phengine	dote Interpreted as peak metamorphism, but probably 'reworked' during echamation greenschist recrystallization prograde crystallization? prograde? (partial) resetting and/or recrystallization (partial) resetting and/or recrystallization (partial) resetting and/or recrystallization	[8]         [8]           [8]         [8]           [8]         [8]           [8]         [8]           [8]         [8]           [8]         [8]           [8]         [8]           [8]         [8]           [9]         [9]           [9]         [9]           [1]         [10]           [10]         [10]
107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 <b>Ar/Ar WM</b> 129 130 131 133	-400-450°C 550°C (Ref. 11)	<ul> <li>S97.234 - grcenschist, ab-chl-ph-ep-qz-cal, rare gle</li> <li>63301 - grcenschist, qz-ph-chl-ab-cal-dol-tm-ap-pg</li> <li>63310 - blueschist, qz-glc-ph-cal-qz-ab-tm-tour-chl</li> <li>63314 - blueschist, ph-glc-qz-qz-tm-chl-ab-cal-ap</li> <li>15-SY-0.02 glaucophane eclogite</li> <li>15-SY-0.12 glaucophane eclogite&lt;</li></ul>	GPS points approximated from 37°2320.99°N 24°5713.35° 37°23'1.66°N 24°579.50°E breecia	N. Oros Syringas Foinikia Delfini Delfini Delfini Construction Delfini Grizzas Grizzas North of Delfini North of Ag. Dinitrios W. Kampos bets Eator Kais	33,6 29,4 33,9 23 30,1 31,3 29,5 34 39,5 33,3 9,5 33,3 9,5 34,3 34 39,5 34,3 34 39,5 34,3 39,7 29,2 29,4 39,6 41,6 41,6 41,6 41,6 41,6 41,6 41,6 41	A fabric-parallel phengines - 3 erg. 1 grain from decusste pressure shadow adjacent to gramet O 4 pseudomorph 23 single phengine O 5 single phengine D 5 single phengine D 5 single phengine D 7 decussater/aduating cluster at high angle to fabric: phus 2 cul + 2 tm O composite fabric-parallel simple O adjaced three parallel simple D 4 decussed relative at high angle to fabric: phus 2 cul + 2 tm O composite fabric-parallel simple O 4 adjaced with schittsting; 3 cp + 2 cul 12 composite #2 17 8 fabric-parallel phengites, 1 epidote, 13 single phengite 13 single phengite 13 single phengite 13 single phengite 05 weighted mean of youngest grains 12 4 wm-omph-glace-op isochron 0.45 4 wm-glace-op isochron 0.45 4 wm-glace-op-op isochron 0.55 4 Ma 10 1 10 1	dote Interpreted as peak metamorphism, but probably 'reworked' during exhamation greenschist recrystallization (partial) resetting and/or recrystallization	8) 8) 8] 8] 8] 8] 8] 8] 8] 8] 8] 8]
107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 124 125 126 127 <b>Ar/Ar WM</b> 133 134 135	400-450°C 550°C (Ref. 11)	<ul> <li>S97.234 - grcenschist, ab-chl-ph-ep-qz-cal, rare gle</li> <li>63301 - grcenschist, qz-ph-chl-ab-cal-dol-tm-ap- P8</li> <li>63310 - blueschist, qz-gle-ph-cal-qz-ab-tm-tour- chl</li> <li>63314 - blueschist, qp-gle-ph-cal-qz-ab-tm-tour- chl</li> <li>63314 - blueschist, ph-gle-qz-ep-tm-chl-ab-cal- ap</li> <li>15-SY-03 glaucophane eclogite</li> <li>15-SY-03 glaucophane eclogite</li> <li>15-SY-042 epidote blueschist</li> <li>17-FB 05 grenschist</li> <li>AG 144 and BSY260 meta-plagiogranite dyke &amp; SY10F netachiert</li> <li>SY10F netachiert</li> </ul>	GPS points approximated from 37°2320.99°N 24°5713.35°I 37°23'17.66°N 24°579.50°E breccia	N. Oros Syringas Foinikia Delfini Delfini Delfini Grizzss Grizzss North of Delfini Grizzss North of Pafrini North of Pafrinis North of Pafrinis Surger of Ag. Dimitrios Hourd of Pabrikas East of Kini Airport W. Kampos belt	33.6 29.4 34 33.9 30.1 33.7 34 39.5 34 39.5 34.3 34.3 34.3 34.7 29.2 29.4 39.6 41.36 26.9 52.3 53.5 54.5 44.5 44.5 40.3 37.1 43.5	A fabric-parallel phengines - 3 cp. 1 grain from decussate pressure shadow adjacent to grarnet 0 4 pseudomorph 2 3 single phengine 0 5 single phengine 1 3 decussate phengine 0 7 decussate/radiating cluster at high angle to fabric: phas 2 cal + 2 tm 0 6 composite holps-isparallel aphengine 2 phengite composite samples 0 4 adjaged with schattscaty; 3 cp + 2 cal 1 2 composite #2 1 7.8 fabric-parallel phengine 1 3 single phengine 0 5 single phengine 1 3 single phengine 0 5 single phengine 1 3 dimeter phengine 0 5 single	dote Interpreted as peak metamorphism, but probably 'reworked' during exhamation greenschist recrystallization prograde cystallization? prograde cystallization? prograde recrystallization (partial) resetting and/or recrystallization	[8] [8] [8] [8] [8] [8] [8] [8] [8] [8]
107 108 109 110 111 112 113 114 115 116 117 118 117 118 121 122 123 124 125 124 125 124 125 124 125 124 125 124 125 124 125 126 127 <b>Ar/Ar WM</b> 131 132 133 134 134 135 134 134 135 134 134 135 134 134 135 134 134 135 134 135 134 135 134 135 134 135 136 137 136 137 137 137 137 137 137 137 137	-400-450'C 550'C (Ref. 11)	<ul> <li>S97.234 - greenschist, ab-chl-ph-ep-qz-cal, rare gle</li> <li>63301 - greenschist, qz-ph-chl-ab-cal-dol-thr-ap- Pg</li> <li>63310 - blueschist, qz-gh-chl-ab-cal-qz-ab-thr-tour- chl</li> <li>63314 - blueschist, ph-glc-qz-ep-thr-chl-ab-cal- ap</li> <li>63314 - blueschist, ph-glc-qz-ep-thr-chl-ab-cal- ap</li> <li>63314 - blueschist, ph-glc-qz-ep-thr-chl-ab-cal- ap</li> <li>6314 - and BSY260 meta-plagiogranite dyke &amp; SY01 metachert</li> <li>SY15 metauff</li> <li>SY501 omphatic metagabbro SY501 omphatic metagabbro SY501 omphatic metagabbro SY50 onghatic metagabbro SY20 metagenite</li> <li>SY20 metagenite</li> </ul>	GPS points approximated from 37°2320.99°N 24°5713.35°1 37°2317.66°N 24°579.50°E breecia	N. Oros Syringas Foinikin Delfini Delfini Delfini E Fabrikas Fabrikas Fabrikas Fabrikas Grizzas Oroth of Delfini North of Delfini North of Delfini North of Delfini North of Charlinios W. Kampos belt Naripott W. Kampos belt Vari	33.6 29.4 33.9 30.1 33.7 34 39.5 34 39.5 34 39.5 34 39.5 34.3 34.3 34.3 34.3 34.3 29.7 29.7 29.4 39.6 41.6 41.36 26.9 52.3 53.5 44.5 40.2 30.3 37.1 48.b 75	4 fabric-parallel phengines + 3 ep. 1 grain from decussate pressure shadow adjacent to gramet 0 4 pseudomorph 2 3 single phengine 3 5 single phengine 1 4 weighted mean of above 3 grains 1 1 decussate phengine 0.7 decussate/radiating cheater at high angle to fabric: phus 2 cal + 2 min 0 6 composite holtonic parallel phengine 2 phengine composite samples 0 6 digned with echistosity 3 ep + 2 cal 1 2 composite #2 1 2 composite #2 1 2 fabric: parallel phengine 1 3 single phengine 1 4 wim-emph-glaue-ep sinchron 0 4 wim-est-ep isochron 0 4 wim-est-ep isochron 0 4 wim-est-ep isochron 0 4 wim-est-ep isochron 0 5 single phengine 1 5 wine-emph-glaue-ep sinchron 0 4 wim-est-ep isochron 0 4 wim-est-ep isochron 0 4 wim-est-ep isochron 0 4 wim-est-ep isochron 0 5 single phengine 1 5 single phengine	dote: Interpreted as peak metamorphism, but probably revorked during echamation greenschist recrystallization prograde? (partial) resetting and/or recrystallization (partial) resetting and/or recrystallization Prograde? (partial) resetting and/or recrystallization Prograde? (partial) resetting and/or recrystallization Prograde? (partial) resetting and/or recrystallization Prograde? (partial) resetting and/or recrystallization	[8] [8] [8] [8] [8] [8] [8] [8] [8] [8]
107 108 109 110 111 112 113 114 115 116 117 118 120 121 122 123 124 125 126 127 <b>Ar/Ar WM</b> 128 129 130 131 132 133 134 135 136	-400-459°C 550°C (Ref. 11)	<ul> <li>S97.234 - grcenschist, ab-chl-ph-ep-qz-cal, rare gle</li> <li>63301 - grcenschist, qz-ph-chl-ab-cal-dol-tm-ap-pg</li> <li>63310 - blueschist, qp-gle-ph-cal-qz-ab-tm-tour-chl</li> <li>63314 - blueschist, ph-gle-qz-ep-tm-chl-ab-cal-ap</li> <li>15-SY -0.3 glancophane celogite</li> <li>15-SY -0.5 glaucophane celogite</li> <li>15-SY -0.5 glaucophane celogite</li> <li>15-SY -0.5 glaucophane celogite</li> <li>17-FB 05 greenschist</li> <li>AG144 and BSY260 meta-plagiogranite dyke &amp;</li> <li>SY01 metachert</li> <li>SY15 metauff</li> <li>SY501 ompacine metagabbro</li> <li>SY76 ompacine metagabbro</li> <li>SY501 ompacine metagabbro</li> <li>SY60 ompacine metagabbro</li> <li>SY60 ompacine metagabbro</li> <li>SY60 ompacine metagabbro</li> <li>SY60 ompacine metagabbro</li> </ul>	GPS points approximated from 3722320.99*N 24*5713.35* 372317.66*N 24*579.50*E breccia	N. Oros Syringas Foinikia Delfini Delfini Delfini Grizzs Grizzs Grizzs North of Delfini North of Pag.Diminicos W. Kampos helt North of Chainia East of Kini Airport W. Kampos helt Vari	33,6 29,4 33,9 23 30,1 33,7 34 39,5 34 39,5 34 39,5 34 39,5 34 39,5 34 39,7 29,7 29,4 39,6 41,26 26,9 52,3 53,5 54,5 41,26 26,9 52,3 53,5 42,5 44,5 44,5 44,5 44,5 44,5 44,5 44	4 fabric-parallel phengines + 3 eq: 1 grain from decusste pressure shadow adjacent to gramet 0 4 pseudomorph 2 3 single phengine 3 5 single phengine 1 4 weighted mean of above 3 grains 1 1 decussate phengine 0 7 decussate/radiating cluster at high angle to fabric: phus 2 cal + 2 tm 0 6 composite hories parallel sample 0 6 composite fabric-sparallel sample 0 6 composite fabric-sparallel sample 1 2 chengine to 2 phengine composite samples 0 4 aligned with schiatosity 3 ep + 2 cal 1 2 composite to 1 2 composite to 1 2 composite to 2 horize phengine 1 2 single phengine 1 2 single phengine 1 2 single phengine 1 2 single phengine 0 6 single phengine 1 3 single phengine 0 5 single phe	dote Interpreted as peak metamorphism, but probably 'reworked' during echamation greenschist recrystalization prograde crystalization? prograde? (partial) resetting and/or recrystalization (partial) resetting and/or recrystalization Prograde? (partial resetting?) Metamorphic crystalization	[8]         [8]           [8]         [8]           [8]         [8]           [8]         [8]           [8]         [8]           [8]         [8]           [9]         [9]           [9]         [9]           [1]         [10]           [10]         [10]           [10]         [10]           [10]         [10]

Table A2: Continued. References: (6) Bröcker et al. (2013), (7) Bröcker and Enders (2001), (8) Cliff et al. (2016), (9) Skelton et al. (2019), (10) Maluski et al. (1987), (11) Laurent et al. (2017)...

138				49.44	2.62	peak conditions	[11]
139	S07-16 Grt-Chl micaschist	37.4992/24.8935	Grammata	55.04	0.56 concentrate	peak conditions	[11]
140	S07-01 Gln-Ep micaschist	37.3891/24.9534	Fabrikas	41.65	0.95 single grain	recrystallization	[11]
141	S07-02 Blueschist	37.3891/24.9534	Fabrikas	43.51	0.56 single grain (2)	recrystallization	[11]
142				41.95	0.77	recrystallization	[11]
143	S07-04 Gln eclogite	37.3891/24.9534	Fabrikas	44.89	0.65 single grain	recrystallization	[11]
144	S07-04bis Gln eclogite	37.3891/24.9534	Fabrikas	40.29	0.73 single grain	recrystallization	[11]
	S07-jojo Gln eclogite	37.3891/24.9534	Fabrikas	48.5	1.1 in situ (10), inverse isochron from eclogitic foliation and blueschist shear band combined (ages not	recrystallization	
145 146	S07-17 Alb-Chl micaschist	37.3791/24.8819	NW of Komito Beach	26.12	resolvably different) 0.52 single grain	recrystallization	[11] [11]
147	5267 Bh Chi Ab On Chi The arbit	N 27° 27 724' E 24° 52 808'	N D-l6-i	35.40	10	An energy 41, 27; Ph. Sectors and 24, 20	161
147	SVP015 Ph Pa Chi Ab Or En Cal Tra schiet	N 27° 27 407' E 24° 56 767'	N. of Agios Dimitrios	28.42	12 gmins analudas Loutliar	Ar ages span 41-27; RD-Sr ages span 34-20	[0]
149	5743 Ph-ChLAh-Oz-En-Cal-Tm-Gr schist	N 37° 23 501' E 24° 54 633'	South Central Posidonia	28.40	12 grains, excludes 1 outlier	sustamation and/or (ra)orustallization of white mion	[6]
150	5246 Ph Pa Chi Ab Or En Cal Tra schist	N 27' 23 642' E 24' 54 151'	South Central Residents	23-40	12 grains	during arbumation and graanschiet faciae	[0]
150	5240 Filling chilling Qriep car fairstailst	1107 2000 221 04101	boun centui, roskonii		1.5 Brands	during exhamilion and greensense needs	[0]
151	89646 quartzite		Palos	39.6	0.1 total fusion age, gradient in apparent	partial loss profile and/or recrystallization after HP evo	ei[12]
					ages 31 to 41.2		
152	89644 glaucophane-marble schist		Kampos belt	53.1	0.2 phengite, total fusion age, graident	HP event	[12]
152	90642 estes and a sale site		Kanna an halt	40.2	0.2 alternative flat and attern and alternative	IID assest	[12]
154	89645 retrograde blueschist		Central	49.2	0.1 total fusion age gradient 34.8 to	nartial loss profile and/or recrustallization after HP	[12]
1.54	oyoro reaograde onesentat		Centur	5710	42.4	event	[12]
155	89649 retrograde blueschist		Airport	43.05	0.12 total fusion age, gradient 40 to 44.2	partial loss profile and/or recrystallization after HP	[12]
						event	
156	SY-7 phengite-rich eclogite		Kampos belt	46.3	0.7 in-situ UV-laser ablation; weighted	paper says prograde; could be partially reset, some	[13]
157	SY-25 omphacite-rich meta-sabbro		Agios Dimitrios	47	1.2 in-situ UV-laser ablation: weighted	paper says prograde; our observations of A a Dim	[13]
			p 17 million (0.5		mean laser fusion ages (n=30)	indicate this is likely recrystallization and/or neo-	[10]
					<u> </u>	crystallization	
						All ages from [14] are interpreted as crystallization ages related to different microstructures using the 'method of asymptotes and limits'	
158	AG10-31 garnet mica schist	37° 30.081'N 24° 53.173'E	N. of Gramatta	53-48	$\Delta 1B$ + early $\Delta 1C$ decussate + post-	timing of ∆1B event	[14]
					$\Delta 1C$ shear zone, pheng-muscovite		
159	AG10-14 gamet mica schist	37° 29.613'N 24° 54.295'E	N. Kampos belt	51, 46-41	$\Delta 1B + \Delta 1C + \text{post-}\Delta 1C$ , older phengite component, younger muscovite component	muscovite component records $\Delta 1C$ growth and post- $\Delta 1C$ shearing	[14]
160	AG10-15 $\Delta 1C$ white mica in boudin neck	37° 29.537'N 24° 54.416'E	Kampos belt	43-47	late Δ1C porphyroblastic white mica, from dilational zone next to mega- hourdin		[14]
161	AG10-16 early $\Delta 1C$ decussate wm + titanite	37° 29.546'N 24° 54.404'E	Kampos belt	47.3	0.4 early ∆1C decussate white mica, from edge of mega-boudin		[14]
162	AG10-26S wm-qz-ab-chl-calc greenschist	37° 26.582'N 24° 54.166'E	E. of Kini, roads above Lotos	31, 28-22	Dominant fabric in greenschist facies	older phengite component; younger muscovite	[14]
163	AG10-26C wm-qz-ab-chl-calc greenschist	37° 26.582'N 24° 54.166'E	E. of Kini, roads above Lotos	16-22	schist (post-Δ1D and Δ2) Extensional shear bands cutting greenschist fabric (relict post-Δ1D +	component muscovite component	[14]
	Kamper transact anaphito vish I we Gut		N of Kampor balt		$\Delta 2 + \text{post-}\Delta 2)$		
	blueschists and micaschists, with intercalated calcite and siliceous layers		rt or rumpos our		single gran jusion experiments		
164	12SR100: graphite-rich Lws-Grt-Gln	N37° 29.855', E24° 54.369'		55-48	broad uniform age		[15]
	micaschist, static gscht.						
165	12SR57: siliceous marble; Phg+Gln+ Ep+Qz+ The+Ch1	N37° 29.856', E24° 54.220'		55-48	broad uniform age		[15]
166	12SR02: graphite-rich Lws(ps)-Grt-Gln micaschist: ttn in foliation	N37° 29.942', E24° 54.566'		52-45	wide uniform age		[15]
167	12SR97: Phg+Qz+Ep+Ttn bearing marble	N37° 29.827', E24° 54.628'		52-45	wide uniform age		[15]
168	12SR03: phg-bearing marble with columnar aragonite pseudomorphs	N37° 29.821', E24° 54.744'		55-40	heterogeneous		[15]
	San Michalis transect - marble-schist-marble		S. of Kampos belt		single grain fusion experiments		
	sequence, middle unit contains pyrite-bearing schists and gneisses, graphite-rich Lws-Grt- Gln micaschists and auartzitic rocks. locally		Ĩ				
	with static greenschist overprint						
169	12SR96: Lws-Grt-Gln micaschist, static gscht	N37°29.393', E24°54.891'		49-45	narrow range		[15]
170	12SR04: Lws-Grt-Gln micaschist, static gscht	N37°29.359', E24°55.125'		48-40	heterogeneous		[15]
171	12SR13b: carbonated and brecciated blueschist;	N37°29.328', E24°55.223'		48-40	heterogeneous		[15]
172	12SR92: Pho-bearing porble: arogonite	N37°29 395' F24°54 975'		48-40	heterogeneous		[15]
• • •	pseudomorphs			40-10	actogeneous		[10]
173	12SR93: Phg-bearing marble; aragonite	N37°29.343', E24°54.904'		50-38	heterogeneous		[15]
	pseudomorphs						
	Syringus transect 1 and 2 - intercalated schist marble sequence; vary from felsic to Ep- blueschists to pervasively overprinted greenschists	-	Syl west coast; Sy2 central		single grain fusion experiments		
174	12SR78: crenulated felsic mica schist	N37°28.830', E24°53.901'		48-42	narrow uniform age		[15]
175	12SR82: calcschist, Phg+Qz+Chl	N37° 28.666', E24° 55.119'		38-31	intermediate		[15]
1/0	125K61: Phg-bearing marble, aragonite pseudo	n 1857~ 28.004°, E24° 55.118'		50-40	neterogeneous		[15]
	Myttakas transect - upper and lower marbles		NE of Delfini, central		single grain fusion experiments		
	bookending felsic schists and gneisses and intermediate-mafic rocks ranging from ep-grt blueschists to pervasively overprinted						
177	greenschists	N127927 8901 12 10 10 10 10		40.20			0.0
177	125R19: r'ng-bearing marble 12SR16: Ep-Ab blueschist (+Grt) nartial	N37°27.796', E24°55.225'		40-39	narrow uniform age		[15]
	greenschist overprint						1.01
179	12SR20: felsic Ab gneiss; Phg+Qz foliation, Ab porphyroblasts	N37°27.871', E24°55.199'		42-30	heterogeneous		[15]

Table A2: Continued. References: (12) Baldwin (1996), (13) Putlitz et al. (2005), (14) Lister and Forster (2016), (15) Uunk et al. (2018) ...

180	12SR18b: intermediate-to-mafic Grt-Ep blueschist: Phg+Gln+Ep matrix	N37°27.841', E24°55.174'		42-30	heterogeneous		[15]
181	12SR18a: blueschist, static greenschist; Phg+Qz matrix	N37°27.811', E24°55.171'		42-30	heterogeneous		[15]
182	12SR17: greenschist mylonite, fine-grained Act+Chl matrix, Ab blasts	N37°27.798', E24°55.154'		42-30	heterogeneous		[15]
183	12SR15: siliceous marble, Ep+Phg+Qz, aragonite pseudomorphs	N37°27.808', E24°55.101'		42-30	heterogeneous		[15]
184 185	Calcite marble, host rock Calcite marble, shear zone	?	N. of Delfini	40.2 37.4	1.6 Si apfu 3.4-3.6, EW stretching 1.3	Authors hypothesized these would be Miocene due to strong EW stretching. Interpreted Eocene ages as evidence that the phengite was not reset during Miocene deformation; our results suggest these could be DT2 greenschist deformation	[16]

Table A2: Continued. References: (16) Rogowitz et al. (2014)

which is a weighted mean of 7 analyses (Tomaschek et al., 2003). The isochrons include 1088 5 Sm-Nd garnet-whole rock (Kendall, 2016), 3 Lu-Hf garnet-omphacite-whole rock (Lagos 1089 et al., 2007), 10 multi-mineral and 2 phengite-whole rock <sup>87</sup>Rb/<sup>86</sup>Sr (Bröcker & Enders, 1090 2001; Bröcker et al., 2013; Skelton et al., 2019). The  ${}^{40}\text{Ar}/{}^{39}\text{Ar}$  ages included in the final 1091 compilation are strong plateaus from step-heating experiments of grains extracted from 1092 well-characterized microstructural domains (Laurent et al., 2017). We excluded: 1 Sm-Nd 1093 isochron with low  $^{147}$ Sm/ $^{144}$ Nd ratio and potential for contamination due to the presence 1094 of an off-isochron inclusion (cf. Kendall, 2016); 50 <sup>40</sup>Ar/<sup>39</sup>Ar ages, and one 10-pt inverse 1095  $^{40}$ Ar/ $^{39}$ Ar isochron that exhibit one or more of the complications described in Section 6.2 1096 (Maluski et al., 1987; Baldwin, 1996; Tomaschek et al., 2003; Putlitz et al., 2005; Bröcker 1097 et al., 2013; Lister & Forster, 2016; Laurent et al., 2017; Uunk et al., 2018). We removed 1098 the 10-pt isochron from the final compilation because its 10 points combine measurements 1099 from an eclogitic foliation and a blueschist cross-cutting shear band which overlap within 1100 error, so this age cannot be conclusively interpreted as either peak eclogite facies nor early 1101 retrograde blueschist facies. It is likely a mixing line between these two 'events.' 1102

Lagos et al. (2007) presented Lu-Hf garnet growth ages from meta-igneous rocks at Grizzas and Kini, showing that those blueschist-eclogite localities reached peak metamorphic conditions at  $51.9\pm1.4$  Ma and  $50\pm2$  Ma, respectively. New fabric ages from Kini blueschists (this study,  $52.62\pm0.64$  Ma) overlap with garnet growth ages at Grizzas and Kini, and with the SHRIMP age determined by Tomaschek et al. (2003) for Grizzas metamorphic zircons.

Fabrikas eclogites record Sm-Nd garnet crystallization ages of  $\sim 45\pm 3$  Ma (Kendall, 2016). 'Bulk' garnet ages ( $48.1\pm 2.3$  Ma) overlap within error with 'rim' ages ( $47.1\pm 3$  Ma), providing evidence for rapid, pulsed garnet crystallization that is distinctly younger than Grizzas and Kini. A weighted mean of Fabrikas garnet ages using Isoplot (Ludwig et al., 2010), weighted by assigned uncertainties, is  $45.1\pm 2.9$  Ma (two sigma). Garnet growth ages are consistent with  ${}^{40}$ Ar/ ${}^{39}$ Ar ages of foliation-forming white mica in Fabrikas glaucophanebearing eclogites ( $48.5\pm 1.1$  Ma to  $44.9\pm 0.6$  Ma, Laurent et al. (2017)).

Retrograde blueschist-facies fabric ages range from  $\sim$ 50-40 Ma, and are captured by: 1115 (1) Phengite-whole rock Rb-Sr isochrons from omphacitites at Kampos ( $49.4\pm0.7$  Ma and 1116  $46.3 \pm 0.7$  Ma, Bröcker and Enders (2001)) and Rb-Sr ages of micro-drilled phengites from 1117 glaucophane-bearing calcschists at Gramatta  $(50.5\pm3.1 \text{ Ma and } 47.3\pm1.2 \text{ Ma}, \text{Cliff et al.})$ 1118 (2016)); (2) A new multi-mineral Rb-Sr isochron from Azolimnos (44.71  $\pm$  0.43 Ma, this 1119 study); (3) A Rb-Sr isochron from omphacite-blueschists  $(41.5 \pm 1.5 \text{ Ma}, \text{Skelton et al.} (2019))$ 1120 and <sup>40</sup>Ar/<sup>39</sup>Ar ages of foliation-forming white mica in retrogressed Fabrikas eclogites and 1121 bluechists  $(44.9\pm0.65 \text{ Ma to } 40.3\pm0.7 \text{ Ma, n}=4, \text{Laurent et al. } (2017)).$ 1122

Retrograde greenschist-facies fabric ages range from  $\sim 42-36$  Ma, and are captured by 1123 Rb-Sr multi-mineral isochrons and Rb-Sr ages of foliation-forming micro-drilled phengites 1124 from greenschists and calcschists from the following locations: (1) Palos ( $40.5\pm1.1$  Ma to 1125  $34.2\pm1.4$  Ma, Cliff et al. (2016)); (2) Syringas ( $39.2\pm3.2$  Ma, Bröcker et al. (2013);  $33.9\pm1.8$ 1126 Ma Cliff et al. (2016); (3) North of Delfini (33.7 $\pm$ 0.6 Ma, Cliff et al. (2016); 33.5 $\pm$ 3.2 Ma 1127 and  $30.8\pm 2.9$  Ma, Bröcker et al. (2013)); (4) Delfini ( $34.2\pm 1.3$  Ma to  $29.4\pm 0.5$  Ma; Cliff et 1128 al. (2016);  $36.47 \pm 0.11$  Ma, this study); (5) Fabrikas ( $26.9 \pm 0.4$  Ma, Skelton et al. (2019)); 1129 and (6) Posidonia  $(28.7\pm2.4 \text{ Ma}, 25.4\pm0.9 \text{ Ma}, 20.5\pm1.3 \text{ Ma}, \text{Bröcker et al. } (2013)).$ 1130

# Appendix B Electron Microprobe Techniques and Data Treatment

# 1132 B1 Qualitative X-Ray Mapping

<sup>1133</sup> Qualitative X-Ray compositional maps were acquired on the JEOL JXA-8200 electron <sup>1134</sup> microprobe at the University of Texas at Austin. Polished 30  $\mu$ m thin sections were analyzed <sup>1135</sup> using a 15 kV accelerating voltage, focused beam, 300 nA current, 6  $\mu$ m step size, and 1 ms <sup>1136</sup> dwell time. X-ray maps for Si, Al, Ca, Mg, Fe, Na, K, Mn, Ti, and P were collected. Post-



Figure B1: Quantitative EPMA results for (A) amphiboles and (B,C) white micas. (A)  $Na_B$  and  $(Na+K)_A$  in amphibole are qualitative indicators of pressure and temperature, respectively. Temperature is less reliable since all of these amphiboles are very 'cold' (i.e., crystallize at <500°). Sodic amphiboles correspond to  $D_S$  and  $D_{T1}$ , and calcic amphiboles correspond to  $D_T_2$ ; see text for significance of core-rim zonations and compositional trends during deformation. (B)  $D_S$  and  $D_{T1}$  white mica chemistry. Elevated Si apfu indicates HP metamorphism. (C)  $D_{T2}$  white mica chemistry. Grains cluster towards a lower Si apfu on average, which reflects more pervasive recrystallization under lower P conditions. Intergrown phengite and paragonite is common during all deformation stages. CBU samples do not contain the limiting assemblage required for Si-in-phengite geobarometry calibrated by (Massonne & Schreyer, 1987). However, they do contain other stable Fe-Mg buffering phases (e.g., epidote, amphibole), so within a given sample and between samples of similar bulk compositions, Si variability is a reasonable measure of *relative* changes in pressure, not absolute. Samples in (B) are all meta-mafics, SY1402 in (C) is meta-mafic, KCS65 in (C) is a quartz-rich mixed meta-volcanic/meta-sediment.

processing to produce false color compositional maps creation was done in ImageJ softwareby merging element channels with assigned colors.

#### 1139 B2 Quantitative Point Analyses

Quantitative analyses were collected for representative amphiboles and micas on the 1140 JEOL JXA-8200 electron microprobe at the University of Texas at Austin. Samples were 1141 selected to cover the range of interpreted structural contexts determined during field work 1142 and microstructural analysis. Polished 30  $\mu$ m thin sections were analyzed using a 15 kV 1143 accelerating voltage, a  $1\mu$ m beam diameter amphibole and a  $10\mu$ m beam diameter for mica, 1144 10 nA current, and counting time 30 s for all elements. Synthetic compounds and homoge-1145 neous minerals were used as standards, and secondary standards were analyzed throughout 1146 analytical procedures. Data were processed using the JEOL ZAF procedure. 1147

Sample:	KCS53 $n=30$	KCS53 n=6	KCS53 <i>n=4</i>	KCS53 <i>n=10</i>	KCS38 <i>n=14</i>	KCS38 <i>n=2</i>	KCS52B $n=21$	KCS52B n=4	KCS52B <i>n=8</i>	KCS52B $n=3$
Context:	matrix cores	cren. limb cores	cren. limb rims	cren. hinges	matrix cores	matrix rims	ecl, cores	ecl, rims	matrix cores	matrix rims
Si02	58.71 0.54	1 58.67 0.32	57.09 1.04	58.60 0.18	59.25 0.22	58.87 0.30	58.54 0.49	58.07 0.20	58.53 0.33	58.03 0.42
A12O3	11.23 0.26	0.05 0.05	11.00 0.12	11.07 0.15	11.78 0.26	11.59 0.13	10.83 0.72	10.11 0.10	11.26 0.20	10.72 0.43
K20	0.01 0.01	0.01 0.01	0.03 0.02	0.01 0.01	0.01 0.01	0.00  0.00	0.00  0.01	$0.00 \ 0.00$	0.01 $0.00$	$0.00 \ 0.00$
Na2O	6.54 0.24	7.06 0.11	6.80 0.29	7.13 0.11	6.93 0.16	7.21 0.04	7.20  0.10	7.13 0.01	7.26 0.09	7.22 0.09
CaO	0.97 0.38	0.80 0.14	1.54  0.87	0.70 0.23	0.91 $0.16$	0.20  0.01	0.32  0.18	0.13 $0.04$	0.34 0.12	0.12 0.08
MnO	0.06 0.04	0.04 0.01	0.10 0.05	0.05 0.02	0.03 0.02	0.09  0.01	0.11  0.08	0.19 $0.02$	0.06 $0.03$	0.17 $0.06$
FeO	9.16 0.55	9.02 0.18	10.19  0.53	9.33 0.43	7.71 0.50	11.05 0.53	11.09 2.27	14.25 0.23	9.39 0.79	11.95 0.66
MgO	11.43 0.37	11.64 0.21	11.30 0.62	11.52 0.41	11.65 0.51	9.67 0.28	10.28 1.16	8.68  0.04	11.04 0.50	9.59  0.48
TiO2	0.03 0.03	0.00 0.01	0.02 0.03	0.02 0.03	0.02 $0.02$	0.03 0.01	0.01  0.02	0.02  0.02	0.01 0.02	0.01  0.02
Cr203	0.02 0.02	0.02 0.02	0.00 0.00	0.02 0.02	0.01 $0.02$	0.00 0.00	0.01  0.02	0.03 0.01	0.02 $0.02$	0.00  0.01
Total	97.89 0.47	98.30 0.26	98.05 0.13	98.44 0.25	98.29 0.49	98.68 0.26	98.37 0.27	98.58 0.15	97.88 0.31	97.79 0.71
Si	7.96 0.05	7.94 0.03	7.81 0.12	7.92 0.03	7.97 0.05	8.00 0.00	7.97 0.02	7.99 0.02	7.96 0.02	7.97 0.02
Al (iv)	0.04 0.04	1 0.06 0.03	0.19 0.12	0.08 0.03	0.04 $0.04$	0.00  0.00	0.03 $0.02$	0.01 0.02	$0.04 \ 0.02$	0.03 $0.02$
K (A)	0.00 0.00	0.00 0.00	0.00  0.00	0.00  0.00	0.00 0.00	0.00  0.00	0.00  0.00	0.00  0.00	$0.00 \ 0.00$	$0.00 \ 0.00$
Na (A)	0.01 0.01	0.04 $0.01$	0.10  0.05	0.05 0.01	0.01 0.01	0.01 $0.00$	0.02 $0.02$	0.00  0.00	0.04  0.01	0.01 $0.02$
Na (B)	1.71 0.06	1.81 0.02	1.70  0.12	1.82  0.03	1.80  0.04	1.89  0.00	1.88  0.04	1.90  0.00	1.88 0.02	1.91  0.04
Ca (B)	0.14  0.06	0.12 0.02	0.23 0.13	0.10  0.03	0.13 0.02	0.03 $0.00$	0.05 $0.03$	0.02  0.01	0.05 $0.02$	0.02 $0.01$
Mn (B, 2+)	0.01 0.00	0.00 0.00	0.01 0.01	0.01 0.00	0.00  0.00	0.01 0.00	0.01 0.01	0.02  0.00	0.01 $0.00$	0.02 $0.01$
Fe (B, 2+)	0.11 0.04	1 0.07 0.01	0.06  0.01	0.07 $0.02$	0.04 $0.04$	0.07 $0.00$	0.06  0.03	0.05 $0.01$	0.07 $0.02$	0.05 $0.04$
Fe (C, 2+)	0.91 $0.06$	0.82 0.05	0.91 $0.09$	0.83 $0.08$	0.81 $0.09$	1.16 0.05	1.02  0.19	1.32  0.04	0.89 $0.09$	1.11 0.05
Fe (C, 3+)	0.02 0.03	0.13 0.04	0.20  0.05	0.16  0.04	0.01 $0.02$	0.03 0.01	0.19 0.13	0.27 0.05	0.11 0.03	0.21 0.10
Al (C, vi)	1.75 0.05	1.70 0.03	1.58  0.10	1.69  0.04	1.83 0.02	1.85 0.01	1.71  0.09	1.63  0.03	1.76  0.03	1.71  0.04
Mg (C)	2.31 0.07	2.35 0.05	2.31 0.13	2.32 0.08	2.34 0.09	1.96  0.05	2.08 0.22	1.78 0.01	2.24 0.09	1.97  0.08
	,			,			,			
Type	Glaucophane	Glaucophane	Glaucophane	Glaucophane	Glaucophane	Glaucophane	Glaucophane	Mg-Riebeckite	Glaucophane	Glaucophane
- 11 - 11	-1-1				- T+ J			J		

Table B1: Amphibole mineral chemistry. Reported values are averages of the number of spots indicated by n values for each sample and micro-textural context. Uncertainties reflect the range of measured values for each micro-textural context as indicated. Cations per formula unit are calculated for ideal element partitioning for 23 Oxygen atoms.

Sample:	KCS52B $n=6$	KCS52B $n=7$	KCS12B <i>n=11</i>	KCS12B $n=8$	SY1402 <i>n=8</i>	SY1402 <i>n=10</i>	SY1402 <i>n=1</i>	SY1402 <i>n=2</i>	SY1402 <i>n</i> =3	SY1402 $n=2$
Context:	ps, cores	ps, rims	matrix cores	matrix rims	incl. in ep, cores	incl. in ep, rims	incl. in alb (A)	incl. in $alb(B)$	matrix cores	matrix rims
Si02	58.58 0.20	57.72 0.42	56.32 0.22	54.03 0.63	57.78 0.15	57.30 0.69	58.28	56.52 1.24	54.13 0.26	54.93 0.96
A12O3	11.35 0.13	10.65  0.44	10.72 0.38	4.92 1.61	8.12 0.87	8.45 1.28	8.05	2.80 0.89	3.12 0.16	2.23 0.60
K20	0.00 0.01	0.00 0.00	0.00  0.00	0.02 0.01	0.02 $0.01$	0.03 $0.03$	0.05	0.19 $0.14$	0.12 0.03	0.09  0.03
Na2O	7.18 0.06	7.24 0.08	7.09  0.14	6.65 0.22	6.50 0.21	6.39 $0.33$	6.45	1.89  0.06	2.49  0.40	1.32 0.17
CaO	0.48  0.06	0.24 0.13	0.29 0.11	0.66  0.33	0.73 $0.33$	0.93 $0.88$	1.14	8.92 0.23	8.58 0.99	10.80 0.26
<b>MnO</b>	0.05 0.01	0.14  0.06	0.06  0.03	0.14  0.03	0.15 $0.07$	0.16  0.07	0.21	0.32 $0.01$	$0.40 \ 0.05$	0.38 $0.03$
FeO	9.08 0.27	12.51 1.43	16.93 0.49	25.10 2.03	15.28 1.08	15.55 1.60	14.41	12.24 1.06	15.64 1.74	12.16 0.79
MgO	11.23 0.34	9.45  0.66	6.50  0.20	5.85 0.25	9.74  0.48	9.29 0.87	10.32	14.93 1.43	13.92 1.11	16.77  0.74
Ti02	0.01 $0.02$	0.01 0.03	0.02 $0.03$	0.02 $0.02$	0.02 $0.03$	0.03 $0.03$	0.00	$0.00 \ 0.00$	0.02 $0.01$	0.01  0.01
Cr203	0.00  0.00	0.01 0.02	0.01 $0.01$	0.00  0.00	0.00  0.00	0.00  0.00	0.00	$0.00 \ 0.00$	$0.00 \ 0.00$	$0.00 \ 0.00$
Total	97.92 0.45	97.93 0.33	97.92 0.29	97.35 0.36	98.33 0.41	98.11 0.62	98.91	97.80 0.85	98.42 0.20	98.69 0.42
Si	7.95 0.02	7.95 0.02	7.93 0.04	7.85 0.04	8.01 0.04	7.98 0.07	8.01	8.01 0.05	7.73 0.06	7.74 0.08
Al (iv)	0.05 $0.02$	0.05 0.02	0.07 $0.04$	0.15 $0.04$	0.01 $0.02$	0.03 0.05	0.00	0.02 $0.02$	0.27 $0.06$	0.26  0.08
K (A)	0.00  0.00	0.00  0.00	0.00  0.00	0.00 0.00	0.00  0.00	0.01 0.00	0.01	0.03 $0.03$	0.02 $0.00$	0.02 $0.00$
Na (A)	0.03 0.01	0.04  0.03	0.05 $0.02$	0.00  0.00	0.00  0.00	0.00  0.00	0.00	$0.00 \ 0.00$	0.14 $0.02$	$0.10 \ 0.02$
Na (B)	1.86  0.01	1.89  0.03	1.88 0.02	1.87 0.05	1.75  0.05	1.73  0.09	1.72	0.52 $0.01$	0.55 0.12	0.26  0.03
Ca (B)	0.07 0.01	0.04  0.02	0.04  0.02	0.10 0.05	0.11 0.05	0.14  0.13	0.17	1.35 0.01	1.31 0.15	1.63  0.03
Mn (B, 2+)	0.01 0.00	0.02 0.01	0.01 $0.00$	0.02 $0.00$	0.02 $0.01$	0.02 0.01	0.02	$0.04 \ 0.00$	0.05 $0.01$	0.05 $0.00$
Fe (B, 2+)	0.07 0.02	0.06  0.02	0.07 $0.02$	0.01 0.01	0.11 0.02	0.10  0.04	0.08	0.05 $0.03$	0.09 $0.03$	0.06 $0.00$
Fe (C, 2+)	0.86  0.06	1.16 0.15	1.74  0.06	1.71  0.06	1.28 0.12	1.35 0.15	1.20	1.36  0.16	1.38 0.16	1.07  0.05
Fe (C, 3+)	0.10  0.03	0.22 0.08	0.18 0.03	1.33 0.28	0.39 $0.16$	0.36  0.18	0.38	0.03 $0.05$	$0.40 \ 0.05$	$0.30 \ 0.06$
Al (C, vi)	1.77  0.02	1.68  0.06	1.71  0.04	0.69 $0.29$	1.32  0.13	1.36 0.17	1.31	0.45 $0.13$	0.26 $0.05$	0.11 0.03
Mg(C)	2.27 0.06	1.94 0.12	1.36 0.04	1.27 0.05	2.01 0.10	1.93 0.17	2.12	3.15 0.25	2.96 0.23	3.52 0.13
E										:
Type	Glaucophane	Glaucophane	Riebeckite	Riebeckite	Mg-Riebeckite	Mg-Riebeckite	Mg-Riebeckite	Winchite	Fe-Winchite	Actinolite
Pabla D1.	V pointino D	in of the second	and chomicture	Donoutod]		of the second	the of anota is	diceted by .	o not conform	ah gamala a

Table B1: Continued. Amphibole mineral chemistry. Reported values are averages of the number of spots indicated by n values for each sample and micro-textural context. Uncertainties reflect the range of measured values for each micro-textural context as indicated. Cations per formula unit are calculated for ideal element partitioning for 23 Oxygen atoms.

## 1148 B3 Mineral classification and formula unit calculations

Quantitative point analyses for amphiboles and white micas were converted from oxide 1149 percentage to atoms per formula unit on the basis of 22O + 2OH, and 10O + 2OH Oxygen 1150 atoms, respectively. Amphibole sub-groups and species were determined following recom-1151 mendations of the Commission on New Minerals Nomenclature and Classification (CNMNC) 1152 of the International Mineralogical Association (IMA) (Hawthorne et al., 2012), and species 1153 names follow the (Leake et al., 1997) classification scheme. Classifications did not assume 1154 initial M-site<sup>3+</sup>/ $\sigma$ M-site ratios, so ferric iron components were estimated based on charge 1155 balance by adjusting valences of Fe and Mn by automatically normalizing the cations. Data 1156 shown here commonly fell into the "sum Si to Ca=15", "sum Si to Mg=13", and "sum Si 1157 to Na=15" normalization schemes (Hawthorne et al., 2012). Hydroxyl contents were not 1158 estimated using OH=2-2Ti, and initial H<sub>2</sub>O contents were not required for calculations. 1159 White mica ferric iron was ignored in formula calculations. 1160

# 1161 Appendix C Supplemental Field Photos



Figure C1: Caption to follow.



Figure C1: Caption to follow.



Figure C1: Caption next page.

Figure C1: (Previous pages.) Supplemental field photographs. (A) Eclogitic meta-gabbro 'blocks' pepper the Kampos Belt landscape, and are wrapped by coherent bimodal metavolcanics (cropping out as resistant ledges in the background). Marbles in the foreground dip down towards the coastline and are structurally concordant with Belt rocks. This is a thrust contact that may have been reworked slightly during exhumation via extension, but we did not see evidence for strongly localized top-to-the-ENE shear. Inset shows example of Kampos meta-gabbro block with glaucophanite carapace. (B) Example of upright, shallowly NNE-plunging  $D_S$  folds on the shoreline W of Kampos Belt. (C) Lia Beach isoclinally-folded blueschists; the older, folded foliation is relict  $D_R$ , and isoclinal folding developed during  $D_{S}$ . (D) Unstrained cm-sized lawsonite pseudomorphs in Grizzas blueschist. (E) Zoom-in to margin of a Kampos Belt block showing static, radiating clusters of blue and green amphibole. (F) Unstrained  $D_S$  lawsonite pseudomorphs in Lia blueschists. (G)  $D_{T1}$  crenulation cross-cutting  $D_S$  at Kini. (H) The cores of  $D_{T1}$  upright folds in Azolimnos schists have strong axial planar cleavages associated with blueschist-to-greenschist facies retrogression. (I) Earlier  $D_S$  fabrics in Azolimnos schists record asymmetric shear in isoclinally-folded schists; pinkish layers are meta-cherts. (J) Isoclinal folds in marbles (foreground) and metaconglomerates (background) and in meta-mafic greenschists (M) on Palos Peninsula mimic the map-scale folding seen in Fig. 2. (K) Sub-horizontal axial planar cleavages form in dolomitic blue-grey marbles during exhumation-related flattening (coaxial strain). (L) Upright  $D_{T1}$  folding at Kalamisia is associated with hinge-parallel greenschist retrogression (N) selectively permeating foliation-parallel layers. (O) Fault contact between marbles and blueschist-eclogite lithologies at Agios Dimitrios. Stretching is directly down-dip (essentially out of the page) and parallel to mullion hinges developed along the contact. Structures on either side of this contact are homogeneous. (P-S, U) Multiple generations of folding at Delfini. (P) Upright  $D_{T2}$  folding (discussed in text) develops an axial planar cleavage and hinge-parallel stretching and mineral lineations defined by quartz, epidote, and actinolite (Q). Older  $D_S$  foliations contain axial planes of isoclinal folds, best seen by salmon-colored meta-cherts (R) and compositional banding (T). Hinge: limb thickness variations locally exceed 20:1 (T, Lotos). (S) Along the limbs of upright folds like (P), coaxial stretching leads to boudinage of competent lenses. These structures record top-WNW shear, but top-ESE structures occur in roughly equal proportions. (U) Symmetric quartz-filled pressure shadows on delta-type  $D_S$  garnet porphyroblasts. (V) Asymmetric, non-coaxial strain during exhumation is limited to localities proximal to the Vari Detachment, like this example from Fabrikas.

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# <sup>846</sup> Appendix A Geochronology

847

## A1 Rb-Sr Methods and Sample Descriptions

Cm-sized pieces of rock were cut out from hand samples to isolate specific fabrics 848 corresponding to progressive stages of deformation-metamorphism as outlined in Section 4. 849 Samples were crushed with a small hammer between sheets of paper, and ground gently with 850 a mini metal rock crusher to separate mineral aggregates. Samples were sieved and separated 851 by grain size. Grain size fractions 125-250  $\mu$ m and 250-500 $\mu$ m were frantzed to separate 852 minerals based on magnetic susceptibility. The first pass was done with strongest magnetic 853 setting ( $\sim 1.8$  Amperes) to remove all non-magnetics (e.g. quartz). Subsequent passes were 854 done starting at the lowest setting where minerals started to magnetically separate (typically 855  $\sim 0.2-0.4$  A); separates were repeatedly passed through the Frantz at increments of  $\sim 0.1-0.2$ 856 A. Magnetic fractions were then cleaned by hand, by either negative or positive picking of 857 phases of interest, including garnet, glaucophane, epidote, and white micas (and apatite and 858 chlorite for retrograde fabrics). White mica separates were cleaned of inclusions by gently 859 smearing them in a mortar and pestle and washing them through a sieve with ethanol. 860

SY1616 was collected from float blocks at Kini Beach immediately beneath in-place blueschist-to-eclogite facies cliff faces. The sample is representative of  $D_S$  in blueschisteclogite lithologies. The foliation is defined by glaucophane, epidote, phengite, paragonite, and rutile, with porphyroblasts of garnet and omphacite. Glaucophane, epidote, omphacite, and phengite define the lineation. A similar rock type is shown in Figure 7A. The prograde fabric was targeted for geochronology.

KCS1617 was collected from Azolimnos (approximate location:  $37^{\circ}$  24'43.86"N, 24° 57'55.42"E). The sample records an older D<sub>S</sub> cleavage cross-cut by the D<sub>T1</sub> upright crenulation. The mineral assemblage includes glaucophane, epidote, quartz, phengite, paragonite, garnet, rutile, titanite, and oxides. The D<sub>T1</sub> fabric was cut out of the sample using a diamond-tipped rock saw and targeted for geochronology.

KCS1621 was collected from the southern side of Delfini Beach (approximate location: 37°27'14.61"N, 24°53'51.23"E). The sample is representative of  $D_{T2}$ . The foliation is defined by quartz, phengite, paragonite and the lineation is defined by porphyroblasts of epidote and actinolite. This sample is interbedded with quartz-rich schists that have a blue amphibole lineation decimeters to meters above and below. The greenschist-facies fabric was targeted for geochronology.

SY1402 was collected from Lotos (approximate location: 37°26'36.64"N, 24°53'48.87"E). 878 The sample is representative of  $D_{T2}$ , during penetrative greenschist-faces deformation and 879 transposition of older fabrics, and some rocks surpass the ductile-to-brittle transition. The 880 sample collected for geochronology is a reaction rind at the margin of a brittlely boudinaged 881 epidote-rich lens, and includes actinolite, chlorite, epidote, phengite, paragonite, and ap-882 atite. SY1644 was collected from the southern side of Delfini, very close to KCS1621. The 883 sample is representative of  $D_{T2}$ , as rocks locally surpass the ductile-to-brittle transition. 884 Minerals collected for geochronology were precipitated within the boudin neck of a brittlely 885 boudinaged epidote-rich lens including actinolite, epidote, white mica, and calcite. 886

887

# A2 Compilation of previous geochronology on Syros

Figure A1 and Table A2 show a compilation of published metamorphic geochronology for the island of Syros (through 2019), comprising 185 individual published ages from 16 studies and 5 chronometers. Applying filters discussed in Section 6.2 to the dataset shown in Figure 3B reduces the compilation from 89 (excludes igneous zircon) to 44 data points, which are plotted in Figure 11. The refined dataset comprises 65 individual ages (some presented as weighted means) that include 44 single-grain analyses and 21 isochrons. The single-grain analyses include 6  ${}^{40}$ Ar/ ${}^{39}$ Ar white mica (Rogowitz et al., 2015; Laurent et

Sample ID and Summary	Phases defining the isochron	Initial Sr	Age	Uncertainty	MSWD	u
	-				-	ć
SY1616: Kini omphacite-epidote blueschist	paragonite-phengite	0.7032083	53.53	0.17	-	2
	glaucophane-phengite	0.7032228	53.29	0.17	1	2
	omphacite-phengite	0.7032158	53.41	0.17	-	2
	garn et-phengite	0.703212	53.47	0.21	1	7
	epidote-garnet-phengite	0.7032199	53.34	0.15	0.91	ŝ
	epidote-omphacite-phengite	0.7032198	53.34	0.14	0.64	ŝ
	epidote-garnet-omphacite-phengite	0.7032183	53.36	0.14	0.56	4
	glaucophane-omphacite-garnet-phengite	0.7032179	54.37	0.14	0.46	4
	omphacite-paragonite-garnet-phengite	0.7032121	53.47	0.14	0.28	4
	paragonite(x4)-phengite	0.7031964	53.73	0.13	1.4	5
	** ep-glauc-omph-parag-grt ** NO PHENG	0.703221	59.07	8.57	1.7	5
KCS1617: Azolimnos glaucophane-mica blueschist	epidote-phengite	0.7066671	42.14	0.05	1	2
<b>-</b> D	glaucophane-phengite	0.7065696	45.61	0.1	1	2
	paragonite-phengite	0.7065964	45.48	0.05	1	2
	paragonite-phengite-phengite	0.7065992	45.47	0.05	0.41	3
	glaucophane-phengite-phengite	0.7065829	45.56	0.61	8.8	33
	epidote-phengite-phengite	0.706643	45.23	0.05	31	ŝ
	** glaucophane-paragonite(x4) ** NO PHENG	0.7066026	43.44	0.76	10	5
	paragonite(x4)-phengite	0.7065951	45.48	0.13	9.4	5
	8 point isochron (all data, except garnet)	0.7066036	45.43	0.04	23	8
KCS1621: Delfini actinolite-mica greenschist	** paragonite-chlorite ** NO PHENG	0.7066492	35.64	0.39	1	2
D	baragonite-chlorite-phen gite	0.7066201	37.04	0.015	13	
	** enidote-chlorite-naragonite ** NO PHENG	0.7066492	35.64	0.39	7.90E-25	
	epidote-phengite-phengite	0.7067163	36.9	0.03	6.30E-24	ŝ
	epidote-chlorite-phengite(x2)	0.7066195	37.06	0.02	21	4
	epidote-paragonite-phengite(x2)	0.7066498	37.02	0.02	9.8	4
	** epidote-chlorite-paragonite(x3) ** NO PHENG	0.7066471	36.19	0.29	7.9	5
	paragonite(x3)-phengite(x2)	0.7066348	37.05	0.014	16	5
	chlorite-paragonite(x3)-phengite(x2)	0.7066266	37.06	0.013	16	9
	epidote-chlorite-paragonite(x3)-phengite(x2)	0.7066266	37.06	0.013	13	7
	8 point isochron (all data)	0.7065941	36.91	0.013	440	8
SY1644: Deffini mineralization in epidosite boudin neck	epidote-white mica	0.7066098	36.16	0.03	1	7
	actinolite-white mica	0.7067006	35.94	0.03	1	2
SY1402: Lotos reaction rim around epidosite pod	apatite-phen <u>si</u> te l	0.704965	36.49	0.01	1	2
	apatite-phengite2	0.704965	35.94	0.01	1	2
	apatite-phengite3	0.704965	33.18	0.011	1	2
	apatite-phengite4	0.704966	29.43	0.014	1	2
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Table A1: Evaluating the robustness of RD-Sr (assumed) concerned in phases MSWD values as	ages. Various isochrons are calculated for a reflection of another interval	or each samp nd the good	le discusse ass of fit	d in-text, for of all data no	different con vints on a wix	nbinations ven isochro
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Figure A1: Compilation of the locations and ages from published metamorphic geochronology (and magmatic ages from Kampos), from references listed in grey box and discussed in Section 2. Samples are projected onto the cross-section line A-A'-A" as shown in Figure 11. Sample locations are coded by color and shape according to citation, and box colors around reported ages correspond to different chronometers. Abbreviations for boxes with notes indicating the sample's micro-structural and/or lithologic context are as follows: DRX = dynamically recrystallized; wm=white mica, ph=phengite, om=omphacite, gl=glaucophane, ep=epidote, act=actinolie, ap=apatite, wr=whole rock.

re in Figure 3B. References:	
a are plotted against closure temperatu	(2006)
metamorphic geochronology for Syros Island. Data	cker and Enders (1999), (3) Bröcker and Keasling
Table A2: Compilation of published n	(1) Tomaschek et al. $(2003)$ , $(2)$ Bröc

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$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Ite $3$ (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	0.9 magmatic, or seafloor	[3]
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	36       07         37       0         36       0         36       0         36       0         36       0         36       0         37       0         31       0         32       0         33       0         34       0         35       0         36       0         37       0         31       0         32       0         33       0         34       0         35       0         36       0         37       0         31       0         31       0         31       0         32       0         33       0         34       0         35       0         36       0         37       0         31       0         32       0         32       0         32       0         32       0         32       0         32 <t< td=""><td>0.9 metasomatism)</td><td>[3]</td></t<>	0.9 metasomatism)	[3]
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	82       08         75       0         75       0         75       0         75       0         75       0         75       0         75       0         75       0         75       0         75       0         75       0         75       0         75       0         75       0         75       0         75       0         75       0         75       0         76       0         77       0         78       0         79       0         76       0         77       0         78       0         79       0         70       0         70       0         71       0         72       0         73       0         74       0         75       0         76       0         77       0         78       0         79 <t< td=""><td>0.7</td><td>[3]</td></t<>	0.7	[3]
000         000 <td><math display="block"> \begin{array}{cccccccccccccccccccccccccccccccccccc</math></td> <td>0.0</td> <td>[2]</td>	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	0.0	[2]
$ \begin{array}{ccccccc} & & & & & & & & & & & & & & & &$	9 Omphactitic omph. alb, wm, th, chi.         37*29.362N, 024*54.3351         Kumpos ket blackwall zone         0.0           9 Omphactitic omph. alb, wm, th, chi.         37*29.362N, 024*54.3351         Kumpos ket blackwall zone         20.1           9 Omphactitic omph. alb, wm, th, chi.         37*29.362N, 024*54.3351         Kumpos ket blackwall zone         20.3         angement           9 Omphactitic omph. alb, wm, th, chi.         37*29.362N, 024*54.3351         Kumpos ket blackwall zone         20.1         0.5         oscillanory zoned zicons (fikely ques           9 Omphactitic angle of mean         79.3         1.0         0.5         oscillanory zoned zicons (fikely ques           9 Omphactitic angle of mean         79.3         0.3         means         0.3         means           9 Omphactitic angle of mean         79.3         0.3         means         0.3         means           9 Omphactitic and bio	0.0	[c]
73.6       07	73.6     07       73.9     07       73.9     07       73.9     07       73.9     0.7       73.9     0.7       73.9     0.7       73.9     0.7       73.9     0.7       73.9     0.7       73.9     0.7       90.0     0.7       73.9     0.7       91.0     0.7       73.1     0.7       92.2     0.7       93.3     0.7       94.3     0.7       94.3     0.7       95.3     0.7       96.3     0.7       97.4     0.4       97.5     0.3       97.5     0.3       97.5     0.3       97.5     0.3       97.5     0.3       97.5     0.3       97.5     0.3       97.5     0.3       97.5     0.3       97.5     0.3       97.5     0.3       97.5     0.3       97.5     0.3       97.5     0.3       97.5     0.3       97.5     0.3       97.5     0.3       97.5     0.3       97.5     0.3 <td>0.8</td> <td>[5]</td>	0.8	[5]
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	734       09         735       07         735       07         735       14         735       14         735       14         735       14         735       14         735       14         735       14         735       14         735       14         735       14         735       14         735       14         735       15         735       16         735       16         735       16         735       16         735       16         735       16         735       16         735       16         735       16         735       16         735       16         735       16         735       16         735       17         735       16         735       17         735       16         735       17         735       18         730       17 <td< td=""><td>0.7</td><td>[3]</td></td<>	0.7	[3]
817       0.7       0.7       0.1         90       0.7       0.1       0.1       0.1         90       0.7       0.1       0.1       0.1       0.1         90       0.7       0.1       0.1       0.1       0.1       0.1         90       0.1<	80.7         0.7         0.7           7.3         0.7         0.7           7.3         0.7         0.7           7.3         0.7         0.7           9.8         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.9         0.7         0.7           9.7         0.7         0.7	0.9	[3]
700       0.1       0	90     0.7       7.3     1.4       7.3     1.4       7.3     1.4       7.3     1.4       7.3     1.4       7.3     1.4       90     0.7       80     0.7       80     0.7       80     0.7       81     0.7       90     0.3       91     0.3       91     0.3       92     0.3       92     0.3       92     0.3       92     0.3       92     0.3       92     0.3       93     0.3       9405     0.4       9405     0.3       9405     0.3       9405     0.3       9405     0.3       9405     0.3       9405     0.3       9405     0.3       9405     0.3       9405     0.3       9405     0.3       9405     0.3       9405     0.3       9405     0.3       9405     0.3       9405     0.3       9405     0.3       9405     0.3       9405     0.3       9405 <t< td=""><td>0.7</td><td>[5]</td></t<>	0.7	[5]
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	90     0.7       73     0.6       73     0.7       73     0.7       74     0.7       75     0.7       75     0.7       75     0.7       75     0.3       75     0.3       75     0.3       75     0.3       75     0.3       75     0.3       75     0.3       75     0.3       75     0.3       75     0.3       75     0.3       75     0.3       75     0.3       75     0.3       75     0.3       75     0.3       75     0.3       75     0.3       75     0.4       75     0.4       75     0.3       75     0.3       75     0.3       75     0.4       75     0.4       75     0.4       75     0.5       75     0.5       75     0.3       75     0.4       75     0.4       75     0.4       75     0.4       75     0.3       75		5
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	0.7	[6]
$ \begin{array}{ccccccc} 738 & 0.6 \\ 8.8 & 0.7 \\ 8.8 & 0.8 \\ 8.8 & 0.7 \\ 8.8 & 0.8 \\ 8.8 $	$ \begin{array}{cccc} & & & & & & & & & & & & & & & & & $	0.7	[5]
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccc} & & & & & & & & & & & & & & & & & $	0.6	[3]
818       07       0 <td>808     0.7       arvange     78.9     2.2       90mphacitie: omph, alb, wm, th, chl.     37°29.362N, 024°54.335E     Kampos belt blackvall zone     79.1     0.5 ostillaroy zoned zircons (litely 2006)       90mphacitie: omph, alb, wm, th, chl.     37°29.362N, 024°54.335E     Kampos belt blackvall zone     79.1     0.5 ostillaroy zoned zircons (litely 2006)       ques     78.7     0.3     0.3     migmatic, or seaffoor       ques     78.7     0.4     0.4       arverage     78.7     0.3     0.3       run of comph, ri, th, ze, all, wm, bt     78.9     0.8     0.8       Claucophanie: gluoophanies subordinate 37°29.362N, 024°54.335E     Kampos belt blackvall zone     78.9     0.8       arverage     78.9     0.8     0.8     0.8     0.9       arverage     78.9     0.8     0.8     0.9       arverage     79.9     0.8     0.9     0.9       arverage     79.0</td> <td>1.4</td> <td>[3]</td>	808     0.7       arvange     78.9     2.2       90mphacitie: omph, alb, wm, th, chl.     37°29.362N, 024°54.335E     Kampos belt blackvall zone     79.1     0.5 ostillaroy zoned zircons (litely 2006)       90mphacitie: omph, alb, wm, th, chl.     37°29.362N, 024°54.335E     Kampos belt blackvall zone     79.1     0.5 ostillaroy zoned zircons (litely 2006)       ques     78.7     0.3     0.3     migmatic, or seaffoor       ques     78.7     0.4     0.4       arverage     78.7     0.3     0.3       run of comph, ri, th, ze, all, wm, bt     78.9     0.8     0.8       Claucophanie: gluoophanies subordinate 37°29.362N, 024°54.335E     Kampos belt blackvall zone     78.9     0.8       arverage     78.9     0.8     0.8     0.8     0.9       arverage     78.9     0.8     0.8     0.9       arverage     79.9     0.8     0.9     0.9       arverage     79.0	1.4	[3]
$ \begin{array}{cccc} & & & & & & & & & & & & & & & & & $		0.7	[3]
$\begin{tabular}{l l l l l l l l l l l l l l l l l l l $	average 73, 53 reported weighted mean 79, 05 ostillatory zoned zircons (thely 00mblacitie: omph, alb, wm, tm, chi, 37°29,362N, 024°54,335E Kampos belt blackwall zone 79, 0.5 magnatic, or saeffoor 79, 0.3 magnatic, or saeffoor 76, 0.5 76, 0.5 77,		[6]
reported vergited mean better and the photownit control of tho photomic control of the photownic control of the photow	Propried vogited near     73.0       Omplacitie: omph, alb, wm, tm, chl,     37°29.362N, 024°54.335E     Kampos belt blackwall zone     79.1     0.5     oscillatory zoned zircons (tikely real       90     0.3     magmatic, or scalloor     73.6     0.3     magmatic, or scalloor       91     0.7     0.5     oscillatory zoned zircons (tikely       92     0.8     magmatic, or scalloor     76.7     0.5       76     0.5     7.6     1.0       77.6     1.0     7.6     1.0       77.6     1.0     7.6     1.0       71.6     1.0     7.6     1.0       71.6     1.0     7.6     1.0       71.6     1.0     7.6     1.0       71.6     1.0     7.6     1.0       71.6     1.0     7.6     1.0       71.6     1.0     7.6     1.0       71.6     1.0     7.6     1.0       71.6     1.0     7.6     1.0       71.6     1.0     7.6     1.1       71.6     1.0     7.6     1.2       71.6     1.0     7.6     1.2       71.6     1.0     7.6     1.2       71.7     1.2     7.7     1.3       71.7 <td>1.1 0</td> <td>[6]</td>	1.1 0	[6]
Popriater weighter mean Point Poin	reported wegnear mean 75.3 0.7 9 Omphacitie: omph. alb, wm, th., 37°29,362N, 024°54,335'E Kampos belt blackwall zone 75, 0.5 oscillatory zoned zircons (likely gues 75, 0.3 mgmaric, or seaffoor 75, 0.5 mgmaric, or seaffo	0.0	
9 Omplacitie: onph, alb, wn, fn, chil, 37°29.362N, 024°54.335'E Kampos beh blackwall zone 70, 0.5 oscillatory zoned zircons (likely 2004) angmatic, or scaffoor 20, 20, 20, 30, 20, 30, 30, 30, 30, 30, 30, 30, 30, 30, 3	9 Omphacitie: omph. alb, wm, Im, chil.     37°29,362N, 024°54,335'E     Kampos belt blackwall zone     70     0.5 oscillatory zoned zircons (tikely according to the sendion of t	0.7	
$\begin{array}{ccccc} & & & & & & & & & & & & & & & & &$	<ul> <li>9. Comparature: comparato, wm, un, cm, 3/29, 962/N, 024°54, 335/E, Kumpos cer backWait Zone (2): 0.1 coedilatory zoned zircons (Riedy 2004)</li> <li>9. S. S. Costilatory zoned zircons (Riedy 2014)</li> <li>7. S. S. C. S. B. metasonatism)</li> <li>7. S. S. S. S. B. metasonatism)</li> <li>7. S. S.</li></ul>		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{rcrc} 79, 9 & 0.3 mgmutic, er sentloor \\ 8,5 & 0.8 metasonatism) \\ 7,6 & 0.5 \\ 7,6 & 0.5 \\ 7,6 & 1.0 \\ 7,6 & 1.0 \\ 7,6 & 1.0 \\ 7,6 & 1.0 \\ 7,6 & 1.0 \\ 7,6 & 1.0 \\ 7,6 & 1.0 \\ 7,6 & 1.0 \\ 7,6 & 1.0 \\ 7,6 & 1.0 \\ 7,8 & 0.5 \\ 7,8 & 0.5 \\ 7,9 & 1.2 \\ 7,9 & $	0.5 oscillatory zoned zircons (likely	[5]
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{llllllllllllllllllllllllllllllllllll$	0.3 magmatic, or seafloor	[3]
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	0.8 metasomatism)	3
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	76.7       0.3         76.7       0.3         76.7       0.3         76.7       0.3         76.7       0.3         76.7       1.0         76.7       1.0         76.7       1.0         77.6       1.0         77.7       1.8         77.8       0.5         77.9       0.6         78.9       0.8 <magnutic, or="" scalfoor<="" td="">         79.9       0.8<magnutic, or="" scalfoor<="" td="">         79.9       0.8         79.9       0.8         79.9       0.8         79.9       0.8         79.9       0.8         79.9       0.8         79.9       0.8         79.9       0.8         79.9       0.7         79.1       1.2         79.2       0.7         79.2       0.7         79.3       0.9         79.4       0.7         79.2       0.7         79.2       0.7         79.2       0.7         79.3       0.9         79.4       0.7         79.5       0.7         <td< td=""><td></td><td>[2]</td></td<></magnutic,></magnutic,>		[2]
$ \begin{array}{ccccc} 7 & 0.5 & 0.5 \\ 7.6 & 1.0 & 0 & 0 \\ 7.6 & 1.0 & 0 & 0 \\ 7.6 & 1.0 & 0 & 0 \\ 7.6 & 1.0 & 0 & 0 & 0 \\ 7.6 & 1.0 & 0 & 0 & 0 \\ 7.6 & 1.0 & 0 & 0 & 0 \\ 7.6 & 1.0 & 0 & 0 & 0 \\ 7.6 & 1.0 & 0 & 0 & 0 & 0 \\ 7.6 & 1.0 & 0 & 0 & 0 & 0 \\ 7.6 & 1.0 & 0 & 0 & 0 & 0 \\ 7.6 & 1.0 & 0 & 0 & 0 & 0 \\ 7.8 & 1 & 0 & 0 & 0 & 0 \\ 7.8 & 1 & 0 & 0 & 0 & 0 \\ 7.8 & 1 & 0 & 0 & 0 & 0 \\ 7.8 & 1 & 0 & 0 & 0 & 0 \\ 7.8 & 1 & 0 & 0 & 0 & 0 \\ 7.8 & 1 & 0 & 0 & 0 & 0 \\ 7.8 & 1 & 0 & 0 & 0 & 0 \\ 7.8 & 1 & 0 & 0 & 0 & 0 \\ 7.8 & 1 & 0 & 0 & 0 & 0 \\ 7.8 & 1 & 0 & 0 & 0 & 0 \\ 7.8 & 1 & 0 & 0 & 0 & 0 \\ 7.8 & 1 & 0 & 0 & 0 & 0 \\ 7.8 & 1 & 0 & 0 & 0 & 0 \\ 7.8 & 0 & 0 & 0 & 0 & 0 \\ 7.8 & 0 & 0 & 0 & 0 & 0 \\ 7.8 & 0 & 0 & 0 & 0 & 0 \\ 7.8 & 0 & 0 & 0 & 0 & 0 \\ 7.8 & 0 & 0 & 0 & 0 & 0 \\ 7.8 & 0 & 0 & 0 & 0 & 0 \\ 7.8 & 0 & 0 & 0 & 0 \\ 7.$	6.7       0.3         7.6       1.0         7.6       1.0         7.6       1.0         7.6       1.0         7.6       1.0         7.6       1.0         7.6       1.0         7.6       1.0         7.6       1.0         7.6       1.0         7.6       1.8         0.8       0.8         0.8       agmutic rescalator         1.1       1.2         1.2       0.8         1.3       2.1         2.4       1.2         2.5       1.3         2.6       0.8         1.1       1.2         2.1       1.2         2.2       1.3         2.3       0.3         2.3       0.3         2.3       0.7         2.4       0.7         2.5       0.7         2.5       0.7         2.5       0.7         2.5       0.7         2.5       0.7         2.5       0.7         2.6       0.7         2.7       0.7         2.8<		[c]
7.9       10       [3] <i>average</i> 7.6       1.0       [3] <i>reported weighted mean</i> 7.8       0.5       [3]         flaucophanic glaucophane: subordinate 37°29.362N, 024°54.335E       Kampos leh blackwall zone       78.9       0.8 socilitory zoned zircons (likely       [3]         ints of onph. it. th., ze, all, wn., bit       7°.9       0.8 magnitory zoned zircons (likely       [3]       [3]         78.9       1.2       magnitory zoned zircons (likely       [3]       [3]         79.1       1.2       magnitory zoned zircons (likely       [3]         79.1       1.2       mesonitism)       [3]         79.1       1.2       magnitory zoned zircons (likely       [3]         79.1       1.2       magnitory zoned zircons (likely       [3]         79.1       1.2       magnitory       [3]         79.1       1.2       magnitory       [3]         79.1       1.2       [3]       [3]         79.1       1.2       [3]       [3]         79.1       2.3       [3]       [3]         79.1       2.3       [3]       [3]         70.1       2.3       [4]       [6]       [6]	79       10         reported workinge       7.7       1.0         reported workinge       7.7       1.8         Glaucophane: subordinate 37°29.362N, 024°54.335E       Kampos belt blackwall zone       789       0.8 <mgnutic, or="" seafloor<="" td="">         tust of omph, ri, th, zre, all, wm, bt       79.9       0.8<mgnutic, or="" seafloor<="" td="">       79.1       1.2<measomatism)< td="">         tust of omph, ri, th, zre, all, wm, bt       79.1       1.2       1.2       79.1       1.2         rist of omph, ri, th, zre, all, wm, bt       79.1       1.2       79.1       1.2       79.1       1.2         rist of omph, ri, th, zre, all, wm, bt       79.1       1.2       79.1       1.2       79.1       1.2         rist of omph, ri, th, zre, all, wm, bt       79.1       1.2       79.1       1.2       79.1       1.2         rist of omph ri, th, zre, all, wm, bt       79.1       1.2       79.1       1.2       79.1       1.2       79.2       1.3         rist of or rist or rist or rist of or rist or rist or rist or rist or rist or ri</measomatism)<></mgnutic,></mgnutic,>	0.5	[3]
77.6       1.0       [3]         average       73.7       1.8         reported weighted mean       73       0.8         7.9       0.8       0.8       0.8         7.9       0.8       0.8       0.8         7.9       0.8       0.8       0.8         7.9       1.2       0.8       0.8         8.0       1.2       0.8       0.8         7.9       1.2       0.8       0.8         7.9       1.2       0.8       0.8         7.9       1.2       0.8       0.8         7.9       1.2       0.8       0.9       0.8         7.1       1.2       0.3       0.3       0.3         7.1       1.2       0.3       0.3       0.3         7.4       0.7       7.3       0.3       0.3         7.4       0.7       7.3       0.3       0.3       0.3         80.6       1.0       1.0       1.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3	77.6       1.0         arverage       78.7       1.8         7.9       0.8       0.8         0.1       0.8       0.8         0.1       0.8       0.8         0.1       0.8       0.8         0.1       0.8       0.10         0.1       0.8       0.10         0.1       0.1       0.1         0.1       0.1       0.1         0.1       0.1       0.1         0.1       0.1       0.1         0.1       0.1       0.1         0.1       0.1       0.1         0.2       0.1       0.1         0.2       0.1       0.1         0.3       0.1       0.1         0.4       0.1       0.1         0.4       0.1       0.1         0.4       0.1       0.1         0.4       0.1       0.1         0.4       0.1       0.1         0.4       0.1       0.1         0.4       0.1       0.1         0.4       0.1       0.1         0.4       0.1       0.1         0.4       0.2       0.3	1.0	[3]
average       %.7       1.8       0.5         reported weighted mean       79.8       0.5       0.5         Glaucophane: subordinate 37°29.562N, 024%4.335E       Kampos beh blackwall zone       78.9       0.8 socillatory zoned zircons (thely       [3]         ints of emph, ri, tin, ze, all, wm, bt       79.9       0.8 socillatory zoned zircons (thely       [3]       [3]         78.9       1.2       magnatics, or scattoor       7.9       0.8       [3]       [3]         78.9       1.2       magnatics, or scattoor       [3]       [3]       [3]       [3]         78.9       1.2       meanatism)       1.2       [3]       [3]       [3]       [3]         78.9       0.8       0.8       0.8       0.8       [3]       [3]       [3]         78.9       1.1       1.2       meanatism)       [3]       [3]       [3]       [3]         74.4       0.7       7       7       7       [3]       [3]       [3]         79.1       1.2       1.2       1.2       1.2       [3]       [3]       [3]       [3]       [3]       [3]       [3]       [3]       [3]       [3]       [3]       [3]       [3]       [3]       [3	average 78.7 1.8 reported weighted mean 79.8 0.5 Glaucophanite glaucophane; subordinate 37°29.362N, 024°54.335E Kampos belt blackwall zone 78.9 0.8 magmatic, or seaffoor nats of omph, ri, tin, zer, all, wm, bt 77°29.362N, 024°54.335E Kampos belt blackwall zone 78.9 0.8 magmatic, or seaffoor 78.9 1.2 metasomatism) 79.1 1.2 metasomatism) 79.2 0.7 79.2 0.7 79.2 0.7 79.2 0.7 80.3 0.9 80.3 0.	10	] [
reported neighted neurons     9.8     0.5       Glaucophanic: glaucophane: subordinate 37°29.362N, 024°54.335E     Kampos leh blackvall zone     78.9     0.8 socillatory zoned zircons (likely     [3]       nuls of omplu, rt. tn. zrc. all, wm, bit     77°29.362N, 024°54.335E     Kampos leh blackvall zone     78.9     0.8 socillatory zoned zircons (likely     [3]       79.9     0.8     nagmatic, or seafloor     [3]       79.1     1.2     returnmism)     [3]       79.2     0.3     0.8     0.8       79.1     1.2     1.2     [3]       79.2     0.1     1.2     1.2       79.3     0.3     0.8     0.8       70.4     0.7     7.3     [3]       70.4     0.7     7.3     [3]       70.4     0.7     7.3     [3]       70.4     0.7     7.3     [3]       70.4     0.7     7.3     [3]       70.4     1.0     7.4     7.7       70.4     1.0     7.4     7.4       70.4     1.0     7.4     7.4       70.4     7.4     7.4     7.7       70.4     7.4     7.7     7.4       70.4     7.4     7.4     7.7	reported weighted mean     79.8     0.5       Glaucophanite: glaucophane: subordinate 37°29.362N, 024°54.335'E     Kampos beit blackwall zone     78.9     0.8     0.8       79.1     79.1     1.2     79.1     1.2       79.1     79.1     1.2       79.1     1.2       79.1     1.2       79.1     1.2       79.1     1.2       79.1     1.2       79.1     1.2       79.1     1.2       79.1     1.2       79.1     1.2       79.1     1.2       79.1     1.2       79.2     1.3       80.2     0.7       79.2     0.7       79.3     0.7       79.4     0.7       79.2     0.7       79.3     0.9       80.5     0.9       80.5     0.9       80.5     1.0       70.4     7.0       70.4     7.0       70.4     7.0       70.4     7.0       70.4     7.0       70.4     7.0       70.4     7.0       70.4     7.0       70.4     7.0       70.4     7.0       70.4     7.0   <	81	[7]
Glaucophanic: glacophane; subordinate 37°29.362N, 02454.335E       Kampos beh blackwall zone       78.9       0.8 oscillatory zoned zircons (fikely       [3]         79.1       79       0.8 magmatic, or seafloor       [3]         79.1       1.2 metasomatism)       [3]         79.1       1.3       [3]         79.1       1.3       [3]         79.1       1.3       [3]         79.1       0.3       [3]         79.1       0.3       [3]         79.2       0.7       [3]         79.3       0.9       [3]         79.4       0.7       [3]         70.4       0.7       [3]         70.4       0.7       [3]         70.4       0.7       [3]         70.4       0.7       [3]         70.4       0.7       [3]         70.4       1.0	Glaucophanite glaucophane; subordinate 37°29.362N, 024°54.335'E Kampos belt blackwall zone 78.9 0.8 oscillatory zoned zircons (tikely unts of onph, rt, ttn, zre, all, wm, bt 79.1 1.2 measuratism) 79.1 1.2 measuratism) 79.2 1.3 80.0 0.8 80.3 0.9 80.3 0.9 80.6 1.0 arverage 79.8 3.0	0.5	
Glaucophanic: glaucophane: subordinate 37°29.362%, 024°54.3351E       Kampos beh blackwall zone       %9       0.8 accilitory zoned zircons (likely       [3]         79:9       0.8 magmatic, or seaffloar       79:9       0.8 magmatic, or seaffloar       [3]         79:0       1.2 metasonatism)       73       [3]         79:1       1.2       1.3       [3]         79:1       1.2       1.3       [3]         79:1       1.2       1.3       [3]         79:1       1.3       79       [3]         79:1       1.2       1.3       [3]         70:1       1.2       1.3       [3]         70:1       0.8       0.8       0.8       [3]         70:1       0.7       1.3       [3]       [3]         70:1       0.3       0.9       0.8       [3]       [3]         70:1       7       0.7       7       [3]       [3]         70:1       80:3       0.9       0.9       [3]       [3]         70:1       80:6       1.0       1.0       [3]       [3]         70:1       7       0.7       7       [3]       [3]       [3]         70:1       80:1 <td>Glaucophanite:     37°29/362N, 024°54.335E     Kampos belt blackwall zone     78.9     0.8 negmatic, or senfloor       78.9     0.8 magmatic, or senfloor       79.1     1.2     netwantism)       79.1     1.2     79.1       79.1     1.2     79.1       79.2     1.3     79.1       70.2     1.3     79.2       70.1     79.2     0.7       70.2     1.0     70.9       80.3     0.9     80.6       70.4     70.9     70.9       70.4     70.4     70.9       70.4     70.4     70.9       70.4     70.4     70.9       70.4     70.4     70.9       70.4     70.4     70.9       70.4     70.4     70.9</td> <td></td> <td></td>	Glaucophanite:     37°29/362N, 024°54.335E     Kampos belt blackwall zone     78.9     0.8 negmatic, or senfloor       78.9     0.8 magmatic, or senfloor       79.1     1.2     netwantism)       79.1     1.2     79.1       79.1     1.2     79.1       79.2     1.3     79.1       70.2     1.3     79.2       70.1     79.2     0.7       70.2     1.0     70.9       80.3     0.9     80.6       70.4     70.9     70.9       70.4     70.4     70.9       70.4     70.4     70.9       70.4     70.4     70.9       70.4     70.4     70.9       70.4     70.4     70.9       70.4     70.4     70.9		
unts of omph, r, fin, zre, all, wm, bt 79, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,	urus of onph, ri, fin, zre, all, wm, br 739 0.8 magemuits, or seaffloor 731 1.2 measonatism) 732 1.2 measonatism) 733 1.2 measonatism) 734 0.7 734 0.7 735 0.7 736 0.0 803 0.9 803 0.9 803 0.9 805 0.0 805 0.0 805 0.0 806 1.0 806 1.0	0.8 acoillatoon zanad ziroone Aibalu	[3]
аль с акрал к на к с н	ante o cupit, is trat. Accent, with, or settloor 79.1 1.2 metasomatism) 79.1 1.2 metasomatism) 79.1 1.2 metasomatism) 78.4 0.7 78.4 0.7 78.4 0.7 80.3 0.9 80.3 0.9 80.5 1.0 arenge 79.8 3.0		2 5
7.3     1.2 metasomatism)     [2]       79.1     1.2 metasomatism)     [3]       79.1     1.2 metasomatism)     [3]       79.1     1.2     [3]       80.0     0.8     [3]       81.4     0.7     [3]       82.2     1.3     [3]       83.3     0.9     [3]       80.3     0.9     [3]       80.3     0.9     [3]       81.3     0.9     [3]       82.4     1.0     [3]       83.3     0.9     [3]       84.3     0.9     [3]       85.4     1.0     [3]	$\begin{array}{rcrc} 7.5 & 1.1.2 & \text{metasomatum} \\ 7.5 & 1.2 & 1.2 \\ 8.2 & 1.3 \\ 8.0 & 0.8 \\ 7.8 & 0.7 \\ 7.9 & 2.0 \\ 8.0 & 0.9 \\ 8.0 & 1.0 \\ avvage & 7.8 & 3.0 \end{array}$	U.o magmatic, or seatloor	[c] [
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	79.1 1.2 8.2.2 1.3 80.0 0.8 78.4 0.7 79.2 0.7 80.3 0.9 80.6 1.0 average 79.8 3.0	1.2 metasomatism)	[5]
822 1.3 800 0.8 73.4 0.7 79.2 0.7 80.3 0.9 80.6 1.0 80.6	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1.2	[3]
80.0 0.8 78.4 0.7 79.3 0.9 80.3 0.9 80.6 1.0 80.6 1.0 80.	80.0 0.8 81.0 0.7 73.4 0.7 79.2 0.7 80.3 0.9 80.6 1.0 average 79.8 3.0	1.3	[3]
78,4     0.7     73     73     73       79,2     0.7     73     73     73       80,3     0.9     1.0     73       90,8     1.0     73	78.4 0.7 79.2 0.7 80.3 0.9 80.6 1.0 anwrage 79.8 3.0	0.8	25
79.2     0.7       79.2     0.7       80.3     0.9       80.4     1.0       70.8     1.0       71     7.1       72     7.1       73     7.2       74     1.0       75     7.1       76     1.0       71     7.1       72     7.1       73     7.2       74     7.1       75     7.1       76     1.0       77     7.1       78     1.0       79     1.0       70     1.0       71     1.0       72     1.0       73     1.0       74     1.0       75     1.0       76     1.0       77     1.0       78     1.0       79     1.0       70     1.0       70     1.0       70     1.0       70     1.0       70     1.0       71     1.0       71     1.0       72     1.0       73     1.0       74     1.0       75     1.0       75     1.0       75<	79.2 0.7 79.2 0.7 80.3 0.9 80.6 1.0 average 79.8 3.0		[6]
80.5 0.7 [3] 80.6 1.0 [3] 80.6 1.0 [3] 70.9700 70.8 3.0 [3]	80.2 0.7 80.6 1.0 80.6 1.0 average 79.8 3.0		[c]
0, 2, 20 0, 2, 0 0, 1, 0, 0 0, 1, 0, 0 0, 1, 0, 0 0, 1, 0, 0 0, 0, 0, 0, 0 0, 0, 0, 0, 0, 0, 0 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0	80.5 0.7 80.6 1.0 avenge 79.8 3.0		[2]
0.1 0.0 [.] 0.1 0.0 [.] 0.1 0.0 [.]	arreage 79.8 3.0		[6]
	0.0 2.10 average 19.0 5.0	0.1	2 2

			[4] [4] [4] [4] [4] [4]	[5] [5]	[9] [9] [9]
			garnet growth garnet growth 1- garnet growth garnet growth garnet growth	early garnet crystallization (La fractionation) early garnet crystallization (La fractionation) early garnet crystallization (La fractionation)	ages record continuous (partial) resetting of isotopic systematics and/or (re)trystallization of white mica during chumation and greenschist facies retrogression
0.5	1.8 oscillatory zoned zircons (likely         1.3 magmatic, or seafloor         2.0 metasomatism)         1.1         2.1         1.4         1.3         0.7         1.1         1.2         1.3         0.7         1.1         1.3         0.7         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.2         1.1         1.1         1.1         1.1         0.8         0.8         0.8         0.8	<ol> <li>3 oscillatory zoned zircons (likely 1.0 magnatic, or seafboor</li> <li>1.0 metasomatism)</li> <li>1.1</li> <li>1.3</li> <li>0.7</li> <li>0.5</li> <li>1.3</li> <li>0.7</li> <li>0.7</li> <li>0.4</li> </ol>	<ul> <li>6.3 8 grt-katchate-wr isochton</li> <li>3.2 4 grt-wr isochton</li> <li>2.3 buli, grt-grt-grt-wr isochton</li> <li>3 rim of gamet, micredrilled, rim-rim rim pwd-matrix isochton</li> <li>1 5 grt-wr isochton</li> <li>1.6 5 grt-wr isochton</li> </ul>	<ol> <li>ar-zm-ttn-lethovet'4grt isochron; table up digestion</li> <li>ar-omph-lethovet'4grt isochron; table up digestion</li> <li>ar-omph-lethovet'3grt isochron; table up digestion</li> </ol>	<ul> <li>2.4 ph-cal isochron</li> <li>1.3 ph-pp-ab isochron</li> <li>0.9 ph-ep-cal isochron</li> <li>3.2 ph-cal isochron</li> <li>2.9 ph-par-ep isochron</li> </ul>
79.6	77.5 80.4 82.3 73.5 73.7 77.7 73.2 81.3 81.3 81.3 81.1 81.1 81.1 81.1 81.1	76.2 81.3 78.4 76.9 73.1 73.1 73.1 79.6 79.3 78.5 79.1 79.1	57.7 48.8 48.1 47.1 47.1 44.7 43.6	52.2 51.4 50	28.7 20.5 33.5 30.8
reported weighted mean	37°29.362N, 024°54.335F Kampos belt blackwall zone arenge	37°29.362N, 024°54.335'E Kampos belt blackwall zone average reported weighted mean	K ini Fabrikas Fabrikas Fabrikas Autrix Fabrikas Fabrikas	Grizzas Grizzas Kini	N 37 <sup>2</sup> 23,261 <sup>5</sup> E 24 <sup>5</sup> 54,653 <sup>°</sup> South Central, Posidonia N 37 <sup>7</sup> 23,265 <sup>°</sup> E 24 <sup>°</sup> 54,365 <sup>°</sup> South Central, Posidonia N 37 <sup>°</sup> 23,643 <sup>°</sup> E 24 <sup>°</sup> 54,151 <sup>°</sup> South Central, Posidonia N 37 <sup>°</sup> 23,734 <sup>°</sup> E 24 <sup>°</sup> 53,808 <sup>°</sup> N. Delfini N 37 <sup>°</sup> 27,497 <sup>°</sup> E 24 <sup>°</sup> 56 <sup>°</sup> N <sup>°</sup> of Agios Dimitrios
	3152-A Chlorite Actinolite Zone: chl, act, rt, zrc, wm, ap	3152-B Chlorite-Actinolite Zone:	06MSY-6E rutik-bearing celogite 14RSY-8A mix-arich celogite 14BSY-35D mix-arich celogite, float 14BSY-35D mix-arich celogite, float 14BSY-35A, celogite boudin in quartz schist m 14BSY-37A celogite, float	Ag31: meta-igneous breccia Ag85: meta-igneous breccia Ap21: glaucophane eelogie	5243 Ph-Chi-Ab-Qz-Ep-Cai-Tur-Gr schist 2244 Ph-Chi-Ab-Qz-Ep-Cai-Tur schist 5246 Ph-Pg-Chi-Ab-Qz-Ep-Cai-Tur schist 2267 Ph-Chi-Ab-Qz-Cai-Tur schist 2267 Ph-Pg-Chi-Ab-Qz-Ep-Cai-Tur schist SYR015 Ph-Pg-Chi-Ab-Qz-Ep-Cai-Tur schist
	8 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	50 60 65 65 65 65 65 65 65 65 65 65 65 65 65	69 Sm/Nd garnet 600-700°C 70 72 73 73	75 Lu/Hf garnet 600°C 76 77	78 Rb-Sr WM ~500°C +/- 50 79 & isochrons 80 81 82

Table A2: Continued. References: (4) Kendall (2016), (5) Lagos et al. (2007), (6) Bröcker et al. (2013)...

[9]	kely crystallizatio [7] [7]	teschist- and [8] were microdrillet schists and us deformation [8] related (re- [8] [8]	8	[8] [8] [8] [8]	8888	8 8 8 8 8	[8] [8] [8]	8888	[8]	[8]
	interpretation not provided in text; li and/or incipient recrystallization	Purpose fully targeted extensional bli greense hist-facies fabrics. Phengies in adom specific microstanctures in ado metabasics. Interpreted as "continue on a regional scale" and exhumation. )crystallization.	at			â				F
3.2 ph-ep-ab-cal isochron	0.7 ph-wr isochron 0.7 ph-wr isochron	<ol> <li>4 fabric-parallel phongites, 1 randomly oriented aggregate, 2 calcite</li> <li>0.8 single phengite</li> <li>0.8 single phengite</li> <li>1.7 single phengite</li> <li>1.7 migle phengite</li> <li>1.6 mean of above 4 grains</li> </ol>	0.5 4 fabric-parallel phengites, 1 grain. high angle to fabric, 3 calcite	<ul> <li>0.3 single phengue</li> <li>1.1 single phengue</li> <li>1.1 single phengue</li> <li>0.5 single phengue</li> <li>0.5 single phengue, warpped by</li> <li>1.1 high angle phengue, warpped by</li> <li>foliation-parallel phengues</li> </ul>	<ul> <li>2 4 fabric-parallel phengites, 1 calcit</li> <li>0.4 single phengite</li> <li>0.4 single phengite</li> <li>0.5 single phengite</li> <li>3.3 mean of above 4 grains</li> </ul>	<ol> <li>6 fabric-parallel phengites, 4 calcit</li> <li>1.1 single phengite</li> <li>2.3 single phengite</li> <li>0.5 single phengite</li> <li>7 memor ô arreite</li> </ol>	<ul> <li>of single phengle</li> <li>of single phengle</li> <li>of mean of above 2 grains</li> <li>of mean of above 2 grains</li> <li>of single phengle; has fine grained</li> <li>of single phenglie next to it</li> </ul>	<ul> <li>4 fibric-purallel phengites +3 ep; 1 grain from decussate pressure stadow adjacent to gamet</li> <li>0.4 pseudomorph</li> <li>2.3 single phengite</li> <li>0.5 single phengite</li> <li>0.5 single phengit</li> <li>1.1 decussate phengite</li> </ul>	<ol> <li>1 decussate/radiating cluster at high angle to fabric; plus 2 cal + 2 ttn 0.6 composite fabric-parallel sample</li> </ol>	2 phengite composite samples $0.4$ aligned with schistosity; $3 \text{ ep} + 2 \text{ c}$ :
39.2	49.4 46.3	35.2 37.4 37.5 37.5 <b>3</b> 6.1	35.6	32.2 34.6 34.4 <b>3</b> 4.4	41.8 37.1 34.4 <b>38.5</b>	52.5 52.1 46.9 48.6	46.2 46.7 28.5	33.6 29.4 <b>33.9</b> 23	30.1 33.7	31.3
N 37° 28.808' E 24° 54.723' Syringas (S. of Kampos)	Kampos belt Kampos belt	Palos, Diapori	Palos, Diapori		Palos, Diapori	Grammata		N. Ons Syringus	Foinikia	Delfini
5831 Ph-Chl-Ab-Qz-Ep-Cal-Ttn-Act schist	1081 Omphacitite 1083 Omphacitite	63286 - calcschist, cal-ph-glc-qz-ab	63297 - calcschist, cal-ph-glc-ep-qz-ab		63300 - calcachist, cal-ph-glo-chh-qz-ab	63287a - caleschist, cal-ph-grt-dol-gle-qtz-ep- ttn	63287b 63287a	897/234 - greenschist, ab-chl-ph-ep-qz-cal, rare gle	63301 - greenschist, qz.ph.chl-ab-cal-dol-tm-ap pg	63310 - blueschist, ep-gle-ph-cal-qz-ab-ttn-tour chl
83	84 85	88 88 89	91	92 93 95	96 97 99	100 101 102 103	104 105 106	107 108 110	111 112	113

Table A2: Continued. References: (7) Bröcker and Enders (2001), (8) Cliff et al. (2016)...
[8]	8 88888 88	[9] [9]	[1]	[10] [10] [10] [10] [10] [10] [10]	EEEEEEEEE	[9] [9]	[12] [12] [12]
	s pidote	Interpreted as peak metamorphism, but probably 'reworked' during exhumation greenschist recrystallization	en prograde crystallization?	prograde? (predia) resetting and/or recrystalikation (partial) resetting and/or recrystalikation (partial) resetting and/or recrystalikation (predia) resetting and/or recrystalikation (predia) resetting and/or recrystalikation Prograde? Or partial resetting? Metamorphic crystalikation	peak conditions peak conditions peak conditions peak conditions recrystallization recrystallization peak in intermediate unit? peak in intermediate unit? peak in intermediate unit?	Ar ages span 41–27; Rb-Sr ages span 34-20 Ages record continuous (partial) resetting of isotopic systematics and/or (te) srystallization of white mica during exhumation and greenschist facies	rt partial loss profile and/or recrystallization after HP ev HP event anHP event
1.2 composite #2	<ol> <li>7.8 fabric-parallel phengites, 1 epidot 1 apatite, 2 tm, lots of ep inclusionn 3.1 single phengite 1.2 single phengite 1.3 single phengite 1.3 single phengite 0.6 single phengite 0.7 single phengite 0.7 single phengite 0.7 single phengite 0.7 single phengite 0.5 weighted mean of youngest gains</li> </ol>	<ol> <li>2 Awm-omph-ghue-ep isochron</li> <li>1.5 Awm-omph-ghue-ep-ap isochron</li> <li>0.45 Awm-gluac-ep-ap isochron</li> <li>0.4 wm-act-ap isochron</li> </ol>	Ar steps yield apparent ages betwee 0.7 30-54 Ma	1.3 3 1.1 0.9 3.4 1.2 paragonie no Eocene HP history in Vari Unit no Eocene HP history in Vari Unit	0.84 single grain (2) 2.62 0.56 concentrate 0.95 single grain 0.57 single grain 0.53 single grain 0.53 single grain 0.53 single grain 0.52 single grain	10 grains 12 grains, excludes 1 outlier 12 grains 13 grains	<ul> <li>0.1 total fusion age, gradient in apparen ages 31 to 41.2</li> <li>0.2 phengite, total fusion age, graident 32.4 to 55</li> <li>0.2 phengite, flat spectra, weighted me</li> </ul>
29.5	34 33,5 34,3 34,3 34,3 34,3 34,3 34,3 34	39.6 41.6 41.36 26.9	52.3	53.5 442.5 40.2 30.3 37.1 45.3 49.7 48 to 75	50.84 49.44 55.04 41.65 41.65 41.95 41.95 48.5 48.5 26.12	35-40 28-42 28-40 22-30	39.6 53.1 49.2
	Delfini	m map, not provided in text Fabrikas Fabrikas Fabrikas Fabrikas	Grizzas	North of Delfini North of A.g. Dimitrios W. Kampos belt North of Fabrikas East of Kini Airport W. Kampos belt Vari	Grammata Grammata Fabrikas Fabrikas Fabrikas Fabrikas NW of Komito Beach	N. Delfini N. of Agios Dimitrios South Central, Posidonia South Central, Posidonia	Palos Kampos belt Kampos belt
		GPS points approximated fro 37°23'20:99'N 24°57'13.35' 37°23'17.66''N 24°57'9.50''	& breccia		37.4992/24.8935 37.3891/24.9534 37.3891/24.9534 37.3891/24.9534 37.3891/24.9534 37.3891/24.9534 37.3891/24.9534 37.3791/24.8819	N 37° 27,734' E 24° 53,898° N 37° 27,497' E 24° 56,767 N 37° 23,613' E 24° 54,633 N 37° 23,643' E 24° 54,151' N 37° 23,643' E 24° 54,151'	
	63314 - blueschist, ph-gle-qz-ep-ttn-chl-ah-eal ap	<ol> <li>S-SY-03 glutocophane eclogite</li> <li>S-SY-05 glutocophane eclogite</li> <li>S-SY-01-02 epidote blue schist</li> <li>FB 05 greenschist</li> </ol>	<ul> <li>AG144 and BSY260 meta-plagiogranite dyke 4 : 11)</li> </ul>	SY01 metachert SY15 metachert SY30F eclogitic metagabho SY301 complacitic metagabhor SY7 cale schast- metatulf SY66 complacitic metagabhor SY08 caleschist SY20 metagranie	S07-14 Grt-Omph blueschist S07-16 Grt-Chl micaschist S07-01 Gh-Ep micaschist S07-02 Blueschist S07-04 Gh eclogite S07-149tis Gh eclogite S07-147 Alb-Chl micaschist S07-17 Alb-Chl micaschist	5267 Ph-Chl-Ab-Qz-Cal-Tu schist SYR015 Ph-Pg-Chl-Ab-Oz-Ep-Cal-Tu schist 5243 Ph-Chl-Ab-Qz-Ep-Cal-Tu-Gr schist 5246 Ph-Pg-Chl-Ab-Qz-Ep-Cal-Tu schist 5246 Ph-Pg-Chl-Ab-Qz-Ep-Cal-Tu schist	89646 quartzite 89644 glaucophane-marble schist 89642 retrograde eclogite
			/M ~400-450°C 550°C (Ref.				
114	115 116 117 118 118 119 120 121	123 124 125 126	127 Ar/Ar W 128	129 130 131 132 133 135 135	137 138 140 141 142 143 145	147 148 149 150	151 152 153

Table A2: Continued. References: (9) Skelton et al. (2019), (10) Maluski et al. (1987), (11) Laurent et al. (2017), (12) Baldwin (1996)...

89645 retrograde blueschist	Central	39.6	0.1 total fusion age, gradient 34.8 to 42.4	partial loss profile and/or recrystallization after HP event	[12]
89649 retrograde blueschist	Airport	43.05	0.12 total fusion age, gradient 40 to 44.2	artial loss profile and/or recrystallization after HP event	[12]
SY-7 phengite-rich eclogite	Kampos belt	46.3	0.7 in-situ UV-laser ablation; weighted	paper says prograde; could be partially reset, some	[13]
SY-25 omphacite-rich meta-gabbro	Agios Dimitrios	47	1.2 in-situ UV-laser ablidion; verighted mean laser fusion ages $(n=30)$	apper suys prograde or observations of Ag. Dim apper suys prograde. The servatalization and or neo- crystallization	[13]
				41 ages from [14] are interpreted as crystallization ages related to different microstructures using the	
AG10-31 garnet mica schist	37° 30.081'N 24° 53.173'E N. of Gramatta	53-48	$\Delta IB + early \Delta IC decussate + post-$	method of asymptotes and limits' timing of ∆1B event	[14]
AG10-14 garnet mica schist	37° 29.613'N 24° 54.295'E N. Kampos belt	51,46-41	ALC streat ZOTE, pricing-inducevate ALE + ALC + post-ALC, older phengite component, younger mucrovite component	nuscovite component records Δ1C growth and post- Δ1C shearing	[14]
AG10-15 Δ1C white mica in boudin neck	37° 29.537'N 24° 54.416'E Kampos belt	43-47	late $\Delta   C$ porphyroblastic white mica from dilational zone next to mega- boudin		[14]
AG10-16 early Δ1C decussate wm + titanite	37° 29.546'N 24° 54.404'E Kampos belt	47.3	0.4 early ∆1C decussate white mica, from edge of mega-boudin		[14]
AG10-26S wm-qz-ab-chl-calc greenschist	37° 26.582'N 24° 54.166'E E. of Kini, roads above	Lotos 31, 28-22	Dominant fabric in greenschist facies schist (nost-A1D and A2)	older phengite component; younger muscovite commonent	[14]
AG10-26C wm-qz-ab-chl-calc greenschist	37° 26.582N 24° 54.166E E. of Kini, roads above	Lotos 16-22	Extensional shear bands cutting greenschist fabric (relict post-AID + Δ2 + post-Δ2)	nuscovite component	[14]
Kampos transect - graphite-rich Lws-Grt blueschists and micaschists, with intercalated calcite and siliceous layers	N. of Kampos belt		single grain fusion experiments		
12SR100: graphite-rich Lws-Grt-Gln micaschist, static gscht.	N37° 29.855', E24° 54.369'	55-48	broad uniform age		[15]
12SR57: siliceous marble; Phg+Gln+ Ep+Qz+ Ttn+Chl	N37° 29.856', E24° 54.220'	55-48	broad uniform age		[15]
12SR02: graphite-rich Lws(ps)-Grt-Gln micaschist; ttn in foliation	N37° 29.942', E24° 54.566'	52-45	wide uniform age		[15]
12SR97: Phg+Qz+Ep+Ttn bearing marble 12SR03: phg-bearing marble with columnar aragonite pseudomorphs	N37° 29.827', E24° 54.628' N37° 29.821', E24° 54.744'	52-45 55-40	wide uniform age heterogeneous		[15]
San Michalis transect - marble-schist-marble sequence, middle unit contains pyrite-bearing schists and guarses, graphite-rich Lus-Grt- Gin micaschists and quarzitic rocks, locally with static greatschist overprint	S. of Kampos belt		single grain fusion experiments		
12SR96. Lws-Grt-Gln micaschist, static gscht 12SR04: Lws-Grt-Gln micaschist, static gscht 12SR13b: carbonated and brecciated blueschist. Ctd-Gln, Ep	N37°29.393', E24°34.891' N37°29.3539, E24°55.125 •N37°29.328', E24°55.23'	49-45 48-40 48-40	narrow range heterogeneous heterogeneous		[15] [15] [15]

[15]	[15]		[15] [15] [15]		[15] [15]	[15]	[15]	[15]	[15]	[15]	o to [16] uld
											Authors hypothesized these would be Miocene du strong EW stretching. Interpreted Eocene ages as vidence that the phenglue was not reset during Miocene deformation; our results stuggest these on be DT2 greenschist deformation
S	S	fusion experiments	rm age IS	fusion experiments	rm age rm age	S	S	SI	SI	S	ي
heterogeneou	heterogeneou	single grain f	narrow unifo intermediate heterogeneou	single grain f	narrow unifo narrow unifo	heterogeneou	heterogeneou	heterogeneou	heterogeneou	heterogeneou	1.6 Si apfu 3.4-3 1.3
48-40	50-38		48-42 38-31 50-40		40-39 40-39	42-30	42-30	42-30	42-30	42-30	40.2 37.4
		Sy1 west coast; Sy2 central		NE of Delfini, central							N. of Delfini
N37°29.395', E24°54.975'	N37°29.343', E24°54.904'		N37°28.830', E24°53.901' N37° 28.666', E24° 55.119' nN37° 28.664', E24° 55.118'		N37°27.789', E24°55.147' N37°27.796', E24°55.147'	N37°27.871', E24°55.199'	N37°27.841', E24°55.174'	N37°27.811', E24°55.171'	N37°27.798', E24°55.154'	N37°27.808', E24°55.101'	61
12SR92: Phg-bearing marble; aragonite pseudomorphs	12SR93: Phg-bearing marble; aragonite pseudomorphs	Syringas transect 1 and 2 - intercalated schist- marble sequence: vary from felsic to Ep- blueschists to pervasively overprinted greenschists	12SR78: crenulated felsic mica schiat 12SR82: caleschist, Phg+Qz+Chl 12SR81: Phg-bearing marble, angonite pseudor	Myttakas transect - upper and lower marbles bookending fasts schists and greisses and intermediate-majls rocks ranging from ep-grt husechists to pervasively overprinted greenschists	12SR19: Phg-bearing marble 12SR16: Ep-Ab blueschist (+Grt), partial greenschist overprint	12SR20: felsic Ab gneiss; Phg+Qz foliation, Ab porphyroblasts	12SR18b: intermediate-to-mafic Grt-Ep blueschist, Phg+Gln+Ep matrix	12SR18a: blueschist, static greenschist; Phg+Qz matrix	12SR17: greenschist mylonite, fine-grained Act+Chl matrix, Ab blasts	12SR15: siliceous marble, Ep+Phg+Qz, aragonite pseudomorphs	Calcite marble interculated with quartz and dolor Shear zone

   -43-

al., 2017), 37 <sup>87</sup>Rb/<sup>86</sup>Sr white mica (Cliff et al., 2016), and 1 U-Pb SHRIMP zircon age 895 which is a weighted mean of 7 analyses (Tomaschek et al., 2003). The isochrons include 5 896 Sm-Nd garnet-whole rock (Kendall, 2016), 3 Lu-Hf garnet-omphacite-whole rock (Lagos et 897 al., 2007), 10 multi-mineral and 2 phengite-whole rock <sup>87</sup>Rb/<sup>86</sup>Sr (Bröcker & Enders, 2001; Bröcker et al., 2013; Skelton et al., 2019), and one 10-point inverse  ${}^{40}\text{Ar}/{}^{39}\text{Ar}$  (Laurent et 899 al., 2017)). The  ${}^{40}\text{Ar}/{}^{39}\text{Ar}$  ages included in the final compilation are in-situ analyses of 900 grains in thin section (used to construct the 10-point inverse isochron), and strong plateaus 901 from step-heating experiments of grains extracted from well-characterized microstructural 902 domains (Laurent et al., 2017). We excluded: 1 Sm-Nd isochron with low  $^{147}\text{Sm}/^{144}\text{Nd}$  ratio 903 and potential for contamination due to the presence of an off-isochron inclusion (cf. Kendall, 904 2016); and 50  $^{40}$ Ar/ $^{39}$ Ar ages that exhibit one or more of the complications described above 905 (Maluski et al., 1987; Baldwin, 1996; Tomaschek et al., 2003; Putlitz et al., 2005; Bröcker 906 et al., 2013; Lister & Forster, 2016; Laurent et al., 2017; Uunk et al., 2018). 907

Lagos et al. (2007) presented Lu-Hf garnet growth ages from meta-igneous rocks at Grizzas and Kini, showing that those blueschist-eclogite localities reached peak metamorphic conditions at  $51.9\pm1.4$  Ma and  $50\pm2$  Ma, respectively. New fabric ages from Kini blueschists (this study,  $52.62\pm0.64$  Ma) overlap with garnet growth ages at Grizzas and Kini, and with the SHRIMP age determined by Tomaschek et al. (2003) for Grizzas metamorphic zircons.

Fabrikas eclogites record Sm-Nd garnet crystallization ages of  $\sim 45\pm 3$  Ma (Kendall, 2016). 'Bulk' garnet ages (48.1±2.3 Ma) overlap within error with 'rim' ages (47.1±3 Ma), providing evidence for rapid, pulsed garnet crystallization that is distinctly younger than Grizzas and Kini. Garnet growth ages are consistent with  $^{40}$ Ar/ $^{39}$ Ar ages of foliationforming white mica in Fabrikas glaucophane-bearing eclogites (48.5±1.1 Ma to 44.9±0.6 Ma, Laurent et al. (2017)).

Retrograde blueschist-facies fabric ages range from  $\sim$ 50-40 Ma, and are captured by: 919 (1) Phengite-whole rock Rb-Sr isochrons from omphacitites at Kampos ( $49.4\pm0.7$  Ma and 920  $46.3\pm0.7$  Ma, Bröcker and Enders (2001)) and Rb-Sr ages of micro-drilled phengites from 921 glaucophane-bearing calcschists at Gramatta  $(50.5\pm3.1 \text{ Ma and } 47.3\pm1.2 \text{ Ma, Cliff et al.}$ 922 (2016)); (2) A new multi-mineral Rb-Sr isochron from Azolimnos (44.71  $\pm$  0.43 Ma, this 923 study); (3) A Rb-Sr isochron from omphacite-blueschists  $(41.5 \pm 1.5 \text{ Ma}, \text{Skelton et al.} (2019))$ 924 and <sup>40</sup>Ar/<sup>39</sup>Ar ages of foliation-forming white mica in retrogressed Fabrikas eclogites and 925 bluechists  $(44.9\pm0.65 \text{ Ma to } 40.3\pm0.7 \text{ Ma}, n=4, \text{Laurent et al. } (2017))$ . 926

Retrograde greenschist-facies fabric ages range from  $\sim$ 42-36 Ma, and are captured by 927 Rb-Sr multi-mineral isochrons and Rb-Sr ages of foliation-forming micro-drilled phengites 928 from greenschists and calcschists from the following locations: (1) Palos ( $40.5\pm1.1$  Ma to 929  $34.2\pm1.4$  Ma, Cliff et al. (2016)); (2) Syringas ( $39.2\pm3.2$  Ma, Bröcker et al. (2013);  $33.9\pm1.8$ 930 Ma Cliff et al. (2016)); (3) North of Delfini (33.7±0.6 Ma, Cliff et al. (2016); 33.5±3.2 Ma 931 and  $30.8\pm 2.9$  Ma, Bröcker et al. (2013)); (4) Delfini ( $34.2\pm 1.3$  Ma to  $29.4\pm 0.5$  Ma; Cliff et 932 al. (2016);  $36.47 \pm 0.11$  Ma, this study); (5) Fabrikas ( $26.9 \pm 0.4$  Ma, Skelton et al. (2019)); 933 and (6) Posidonia ( $28.7 \pm 2.4$  Ma,  $25.4 \pm 0.9$  Ma,  $20.5 \pm 1.3$  Ma, Bröcker et al. (2013)). 934

## Appendix B Electron Microprobe Techniques and Data Treatment

## 936 B1 Qualitative X-Ray Mapping

Qualitative X-Ray compositional maps were acquired on the JEOL JXA-8200 electron microprobe at the University of Texas at Austin. Polished 30  $\mu$ m thin sections were analyzed using a 15 kV accelerating voltage, focused beam, 300 nA current, 6  $\mu$ m step size, and 1 ms dwell time. X-ray maps for Si, Al, Ca, Mg, Fe, Na, K, Mn, Ti, and P were collected. Postprocessing to produce false color compositional maps creation was done in ImageJ software by merging element channels with assigned colors.



Figure B1: Quantitative EPMA results for (A) amphiboles and (B,C) white micas. (A)  $Na_B$  and  $(Na+K)_A$  in amphibole are qualitative indicators of pressure and temperature, respectively. Temperature is less reliable since all of these amphiboles are very 'cold' (i.e. crystallize at <500°). Sodic amphiboles correspond to  $D_S$  and  $D_{T1}$ , and calcic amphiboles correspond to  $D_{T2}$ ; see text for significance of core-rim zonations and compositional trends during deformation. (B)  $D_S$  and  $D_{T1}$  white mica chemistry. Elevated Si apfu indicates HP metamorphism. (C)  $D_{T2}$  white mica chemistry. Grains cluster towards a lower Si apfu on average, which reflects more pervasive recrystallization under lower P conditions. Intergrown phengite and paragonite is common during all deformation stages. CBU samples do not contain the limiting assemblage required for Si-in-phengite geobarometry calibrated by (Massonne & Schreyer, 1987). However, they do contain other stable Fe-Mg buffering phases (e.g. epidote, amphibole), so within a given sample and between samples of similar bulk compositions, Si variability is a reasonable measure of *relative* changes in pressure, not absolute. Samples in (B) are all meta-mafics, SY1402 in (C) is meta-mafic, KCS65 in (C) is a quartz-rich mixed meta-volcanic/meta-sediment.

#### 943 B2 Quantitative Point Analyses

Quantitative analyses were collected for representative amphiboles and micas on the 944 JEOL JXA-8200 electron microprobe at the University of Texas at Austin. Samples were 945 selected to cover the range of interpreted structural contexts determined during field work 946 and microstructural analysis. Polished 30  $\mu$ m thin sections were analyzed using a 15 kV 947 accelerating voltage, a  $1\mu$ m beam diameter amphibole and a  $10\mu$ m beam diameter for mica, 948 10 nA current, and counting time 30 s for all elements. Synthetic compounds and homoge-949 neous minerals were used as standards, and secondary standards were analyzed throughout 950 analytical procedures. Data were processed using the JEOL ZAF procedure. 951

Sample:	KCS53 $n=30$	KCS53 n=6	KCS53 n=4	KCS53 <i>n=10</i>	KCS38 n=14	KCS38 <i>n=2</i>	KCS52B $n=2I$	KCS52B n=4	KCS52B $n=8$	KCS52B $n=3$
Context:	matrix cores	cren. limb cores	cren. limb rims	cren. hinges	matrix cores	matrix rims	ecl, cores	ecl, rims	matrix cores	matrix rims
Si02	58.71 0.54	1 58.67 0.32	57.09 1.04	58.60  0.18	59.25 0.22	58.87 0.30	58.54 0.49	58.07 0.20	58.53 0.33	58.03 0.42
A12O3	11.23 0.26	0.05 0.05	11.00 0.12	11.07 0.15	11.78 0.26	11.59 0.13	10.83 0.72	10.11 0.10	11.26 0.20	10.72 0.43
K20	0.01 0.01	0.01 0.01	0.03 0.02	0.01 0.01	0.01 0.01	0.00  0.00	0.00  0.01	$0.00 \ 0.00$	0.01 $0.00$	$0.00 \ 0.00$
Na2O	6.54 0.24	7.06 0.11	6.80 0.29	7.13 0.11	6.93 0.16	7.21 0.04	7.20 0.10	7.13 0.01	7.26 0.09	7.22 0.09
CaO	0.97 0.38	0.80 0.14	1.54  0.87	0.70 0.23	0.91 $0.16$	0.20  0.01	0.32  0.18	0.13 $0.04$	0.34 0.12	0.12 0.08
MnO	0.06 0.04	0.04 0.01	0.10 0.05	0.05 0.02	0.03 0.02	0.09  0.01	0.11  0.08	0.19 $0.02$	0.06 $0.03$	$0.17 \ 0.06$
FeO	9.16 0.55	9.02 0.18	10.19  0.53	9.33 $0.43$	7.71 0.50	11.05 0.53	11.09 2.27	14.25 0.23	9.39 0.79	11.95 0.66
MgO	11.43 0.37	11.64 0.21	11.30 0.62	11.52 0.41	11.65 0.51	9.67 0.28	10.28 1.16	8.68  0.04	11.04  0.50	9.59 $0.48$
Ti02	0.03 0.03	0.00 0.01	0.02 $0.03$	0.02 $0.03$	0.02 0.02	0.03 0.01	0.01 0.02	0.02 $0.02$	0.01 $0.02$	0.01 $0.02$
Cr203	0.02 0.02	0.02 0.02	0.00 0.00	0.02 0.02	0.01 $0.02$	0.00 0.00	0.01 0.02	0.03 0.01	0.02 $0.02$	0.00  0.01
Total	97.89 0.47	98.30 0.26	98.05 0.13	98.44 0.25	98.29 0.49	98.68 0.26	98.37 0.27	98.58 0.15	97.88 0.31	97.79 0.71
Si	7.96 0.05	7.94 0.03	7.81 0.12	7.92 0.03	7.97 0.05	8.00 0.00	7.97 0.02	7.99 0.02	7.96 0.02	7.97 0.02
Al (iv)	0.04 0.04	1 0.06 0.03	0.19 0.12	0.08 0.03	0.04 $0.04$	0.00  0.00	0.03 0.02	0.01 0.02	0.04 $0.02$	0.03 $0.02$
K (A)	0.00 0.00	0.00 0.00	0.00  0.00	0.00  0.00	0.00 0.00	0.00  0.00	0.00  0.00	0.00  0.00	0.00  0.00	$0.00 \ 0.00$
Na (A)	0.01 0.01	0.04 $0.01$	0.10  0.05	0.05 0.01	0.01 0.01	0.01 $0.00$	0.02 0.02	0.00  0.00	0.04 $0.01$	0.01 $0.02$
Na (B)	1.71 0.06	1.81 0.02	1.70  0.12	1.82  0.03	1.80  0.04	1.89  0.00	1.88  0.04	1.90  0.00	1.88 0.02	1.91  0.04
Ca (B)	0.14  0.06	0.12 0.02	0.23 0.13	0.10  0.03	0.13 0.02	0.03 $0.00$	0.05 0.03	0.02  0.01	0.05 $0.02$	0.02 $0.01$
Mn (B, 2+)	0.01 0.00	0.00 0.00	0.01 0.01	0.01 0.00	0.00  0.00	0.01 0.00	0.01 0.01	0.02  0.00	0.01 $0.00$	0.02 $0.01$
Fe (B, 2+)	0.11 0.04	1 0.07 0.01	0.06  0.01	0.07 $0.02$	0.04  0.04	0.07 $0.00$	0.06 $0.03$	0.05 0.01	0.07 $0.02$	0.05 $0.04$
Fe (C, 2+)	0.91 $0.06$	0.82 0.05	0.91 $0.09$	0.83 $0.08$	0.81 $0.09$	1.16 0.05	1.02 0.19	1.32  0.04	0.89 $0.09$	1.11 0.05
Fe (C, 3+)	0.02 0.03	0.13 0.04	0.20  0.05	0.16 0.04	0.01 $0.02$	0.03 0.01	0.19 0.13	0.27 0.05	0.11 0.03	0.21 0.10
Al (C, vi)	1.75 0.05	1.70 0.03	1.58  0.10	1.69  0.04	1.83 0.02	1.85 0.01	1.71 0.09	1.63  0.03	1.76  0.03	1.71 0.04
Mg (C)	2.31 0.07	2.35 0.05	2.31 0.13	2.32 0.08	2.34 0.09	1.96  0.05	2.08 0.22	1.78 0.01	2.24 0.09	1.97  0.08
	,			,			,			
Type	Glaucophane	Glaucophane	Glaucophane	Glaucophane	Glaucophane	Glaucophane	Glaucophane	Mg-Riebeckite	Glaucophane	Glaucophane
1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	-1-1				17 J	J			-1	

Table B1: Amphibole mineral chemistry. Reported values are averages of the number of spots indicated by n values for each sample and micro-textural context. Uncertainties reflect the range of measured values for each micro-textural context as indicated. Cations per formula unit are calculated for ideal element partitioning for 23 Oxygen atoms.

Sample:	KCS52B <i>n=6</i>	KCS52B $n=7$	KCS12B <i>n=11</i>	KCS12B $n=8$	SY1402 n=8	SY1402 <i>n=10</i>	SY1402 <i>n=1</i>	SY1402 <i>n=2</i>	SY1402 $n=3$	SY1402 $n=2$
Context:	ps, cores	ps, rims	matrix cores	matrix rims	incl. in ep, cores	incl. in ep, rims	incl. in alb (A)	incl. in alb $(B)$	matrix cores	matrix rims
Si02	58.58 0.20	57.72 0.42	56.32 0.22	54.03 0.63	57.78 0.15	57.30 0.69	58.28	56.52 1.24	54.13 0.26	54.93 0.96
A12O3	11.35 0.13	10.65 0.44	10.72 0.38	4.92 1.61	8.12 0.87	8.45 1.28	8.05	2.80  0.89	3.12 0.16	2.23 0.60
K20	0.00  0.01	0.00  0.00	0.00  0.00	0.02 0.01	0.02 $0.01$	0.03 $0.03$	0.05	0.19 $0.14$	0.12 0.03	0.09  0.03
Na2O	7.18 0.06	7.24 0.08	7.09  0.14	6.65 0.22	6.50 0.21	6.39 $0.33$	6.45	1.89  0.06	2.49 $0.40$	1.32 0.17
CaO	0.48  0.06	0.24 $0.13$	0.29 0.11	0.66  0.33	0.73 $0.33$	0.93 $0.88$	1.14	8.92 0.23	8.58 0.99	10.80 0.26
OnM	0.05 $0.01$	0.14  0.06	0.06  0.03	0.14 0.03	0.15 0.07	0.16  0.07	0.21	0.32 $0.01$	$0.40 \ 0.05$	0.38 $0.03$
FeO	9.08 0.27	12.51 1.43	16.93 0.49	25.10 2.03	15.28 1.08	15.55 1.60	14.41	12.24 1.06	15.64 1.74	12.16 0.79
MgO	11.23 0.34	9.45  0.66	6.50 0.20	5.85 0.25	9.74  0.48	9.29 0.87	10.32	14.93 1.43	13.92 1.11	16.77 0.74
Ti02	0.01 0.02	0.01 $0.03$	0.02 $0.03$	0.02 0.02	0.02 0.03	0.03 $0.03$	0.00	$0.00 \ 0.00$	0.02 $0.01$	0.01 0.01
Cr203	0.00  0.00	0.01 $0.02$	0.01 0.01	0.00 0.00	0.00  0.00	0.00  0.00	0.00	$0.00 \ 0.00$	$0.00 \ 0.00$	$0.00 \ 0.00$
Total	97.92 0.45	97.93 0.33	97.92 0.29	97.35 0.36	98.33 0.41	98.11 0.62	98.91	97.80 0.85	98.42 0.20	98.69 0.42
Si	7.95 0.02	7.95 0.02	7.93 0.04	7.85 0.04	8.01 0.04	7.98 0.07	8.01	8.01 0.05	7.73 0.06	7.74 0.08
Al (iv)	0.05 $0.02$	0.05 0.02	0.07 $0.04$	0.15 $0.04$	0.01 0.02	0.03 $0.05$	0.00	0.02 $0.02$	0.27 $0.06$	0.26  0.08
K (A)	0.00  0.00	0.00  0.00	0.00  0.00	0.00 0.00	0.00  0.00	0.01 $0.00$	0.01	0.03 $0.03$	0.02 $0.00$	0.02 $0.00$
Na (A)	0.03 0.01	0.04  0.03	0.05 $0.02$	0.00 0.00	0.00  0.00	0.00  0.00	0.00	$0.00 \ 0.00$	0.14 $0.02$	$0.10 \ 0.02$
Na (B)	1.86  0.01	1.89  0.03	1.88 0.02	1.87 0.05	1.75 0.05	1.73  0.09	1.72	0.52 $0.01$	0.55 0.12	0.26  0.03
Ca (B)	0.07 0.01	0.04  0.02	0.04 $0.02$	0.10 0.05	0.11 0.05	0.14  0.13	0.17	1.35 0.01	1.31 0.15	1.63  0.03
Mn (B, 2+)	0.01 0.00	0.02 $0.01$	0.01 $0.00$	0.02 0.00	0.02 $0.01$	0.02 $0.01$	0.02	$0.04 \ 0.00$	0.05 $0.01$	0.05 $0.00$
Fe (B, 2+)	0.07 $0.02$	0.06 $0.02$	0.07 $0.02$	0.01 0.01	0.11 0.02	0.10  0.04	0.08	0.05 $0.03$	0.09 $0.03$	0.06 $0.00$
Fe (C, 2+)	0.86  0.06	1.16  0.15	1.74  0.06	1.71 0.06	1.28 0.12	1.35 0.15	1.20	1.36  0.16	1.38 0.16	1.07 0.05
Fe (C, 3+)	0.10  0.03	0.22  0.08	0.18 0.03	1.33 0.28	0.39  0.16	0.36  0.18	0.38	0.03 $0.05$	$0.40 \ 0.05$	$0.30 \ 0.06$
Al (C, vi)	1.77 0.02	1.68  0.06	1.71  0.04	0.69  0.29	1.32 0.13	1.36  0.17	1.31	0.45 $0.13$	0.26 $0.05$	0.11 0.03
Mg(C)	2.27 0.06	1.94 0.12	1.36 0.04	1.27 0.05	2.01 0.10	1.93 0.17	2.12	3.15 0.25	2.96 0.23	3.52 0.13
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Table B1: Continued. Amphibole mineral chemistry. Reported values are averages of the number of spots indicated by n values for each sample and micro-textural context. Uncertainties reflect the range of measured values for each micro-textural context as indicated. Cations per formula unit are calculated for ideal element partitioning for 23 Oxygen atoms.

### <sup>952</sup> B3 Mineral classification and formula unit calculations

Quantitative point analyses for amphiboles and white micas were converted from oxide 953 percentage to atoms per formula unit on the basis of 22O + 2OH, and 10O + 2OH Oxygen 954 atoms, respectively. Amphibole sub-groups and species were determined following recom-955 mendations of the Commission on New Minerals Nomenclature and Classification (CNMNC) 956 of the International Mineralogical Association (IMA) (Hawthorne et al., 2012), and species 957 names follow the (Leake et al., 1997) classification scheme. Classifications did not assume 958 initial M-site<sup>3+</sup>/ $\sigma$ M-site ratios, so ferric iron components were estimated based on charge 959 balance by adjusting valences of Fe and Mn by automatically normalizing the cations. Data 960 shown here commonly fell into the "sum Si to Ca=15", "sum Si to Mg=13", and "sum Si 961 to Na=15" normalization schemes (Hawthorne et al., 2012). Hydroxyl contents were not 962 estimated using OH=2-2Ti, and initial H<sub>2</sub>O contents were not required for calculations. 963 White mica ferric iron was ignored in formula calculations. 964

# <sup>965</sup> Appendix C Supplemental Field Photos



Figure C1: Caption to follow.



Figure C1: Caption to follow.



Figure C1: Caption next page.

Figure C1: (Previous pages.) Supplemental field photographs. (A) Eclogitic meta-gabbro 'blocks' pepper the Kampos Belt landscape, and are wrapped by coherent bimodal metavolcanics (cropping out as resistant ledges in the background). Marbles in the foreground dip down towards the coastline and are structurally concordant with Belt rocks. This is a thrust contact that may have been reworked slightly during exhumation via extension, but we did not see evidence for strongly localized top-to-the-ENE shear. Inset shows example of Kampos meta-gabbro block with glaucophanite carapace. (B) Example of upright, shallowly NNE-plunging  $D_S$  folds on the shoreline W of Kampos Belt. (C) Lia Beach isoclinally-folded blueschists; the older, folded foliation is relict  $D_R$ , and isoclinal folding developed during  $D_{S}$ . (D) Unstrained cm-sized lawsonite pseudomorphs in Grizzas blueschist. (E) Zoom-in to margin of a Kampos Belt block showing static, radiating clusters of blue and green amphibole. (F) Unstrained  $D_S$  lawsonite pseudomorphs in Lia blueschists. (G)  $D_{T1}$  crenulation cross-cutting  $D_S$  at Kini. (H) The cores of  $D_{T1}$  upright folds in Azolimnos schists have strong axial planar cleavages associated with blueschist-to-greenschist facies retrogression. (I) Earlier  $D_S$  fabrics in Azolimnos schists record asymmetric shear in isoclinally-folded schists; pinkish layers are meta-cherts. (J) Isoclinal folds in marbles (foreground) and metaconglomerates (background) and in meta-mafic greenschists (M) on Palos Peninsula mimic the map-scale folding seen in Fig. 2. (K) Sub-horizontal axial planar cleavages form in dolomitic blue-grey marbles during exhumation-related flattening (coaxial strain). (L) Upright  $D_{T1}$  folding at Kalamisia is associated with hinge-parallel greenschist retrogression (N) selectively permeating foliation-parallel layers. (O) Fault contact between marbles and blueschist-eclogite lithologies at Agios Dimitrios. Stretching is directly down-dip (essentially out of the page) and parallel to mullion hinges developed along the contact. Structures on either side of this contact are homogeneous. (P-S, U) Multiple generations of folding at Delfini. (P) Upright  $D_{T2}$  folding (discussed in text) develops an axial planar cleavage and hinge-parallel stretching and mineral lineations defined by quartz, epidote, and actinolite (Q). Older  $D_S$  foliations contain axial planes of isoclinal folds, best seen by salmon-colored meta-cherts (R) and compositional banding (T). Hinge: limb thickness variations locally exceed 20:1 (T, Lotos). (S) Along the limbs of upright folds like (P), coaxial stretching leads to boudinage of competent lenses. These structures record top-WNW shear, but top-ESE structures occur in roughly equal proportions. (U) Symmetric quartz-filled pressure shadows on delta-type  $D_S$  garnet porphyroblasts. (V) Asymmetric, non-coaxial strain during exhumation is limited to localities proximal to the Vari Detachment, like this example from Fabrikas.