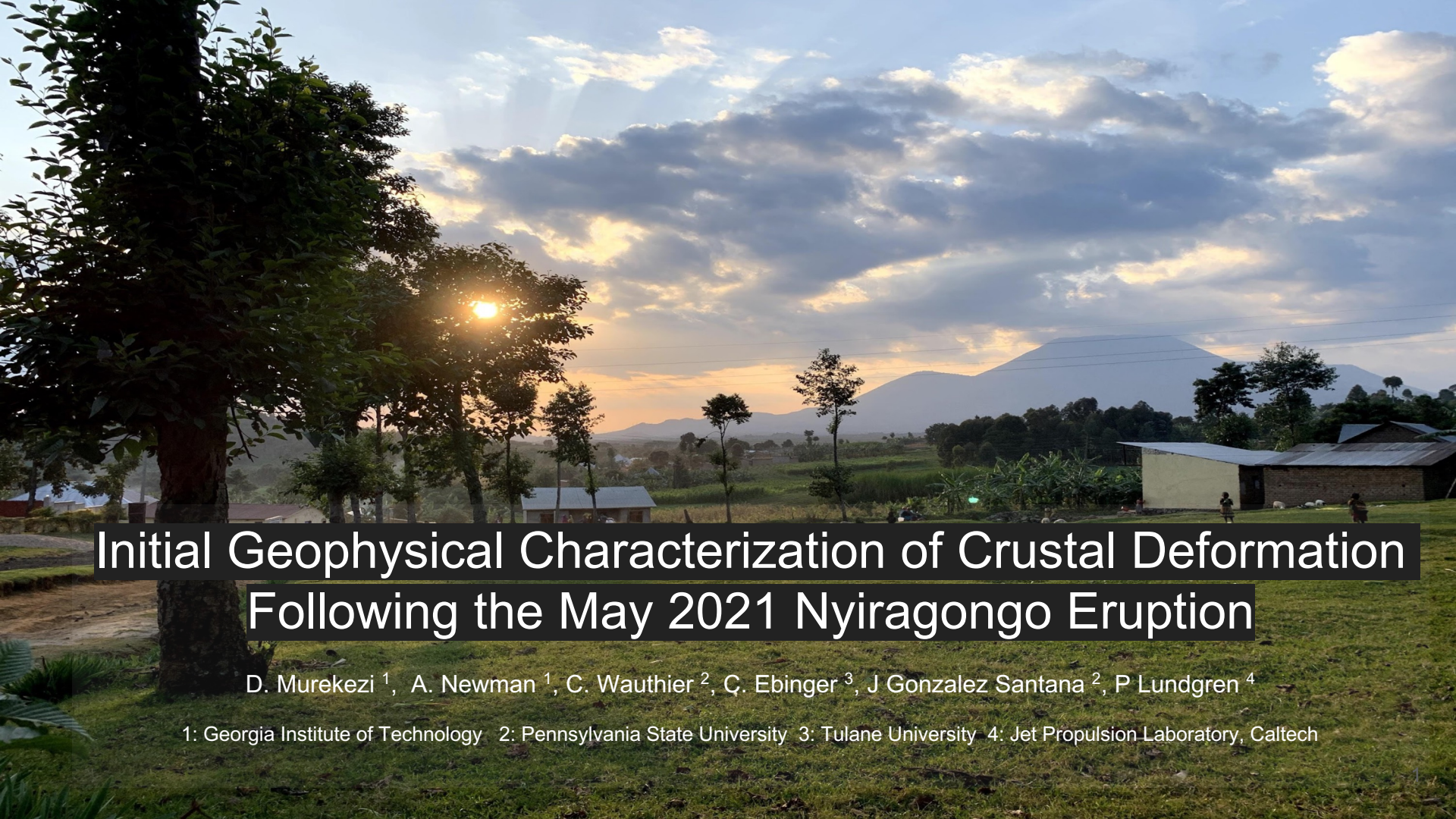
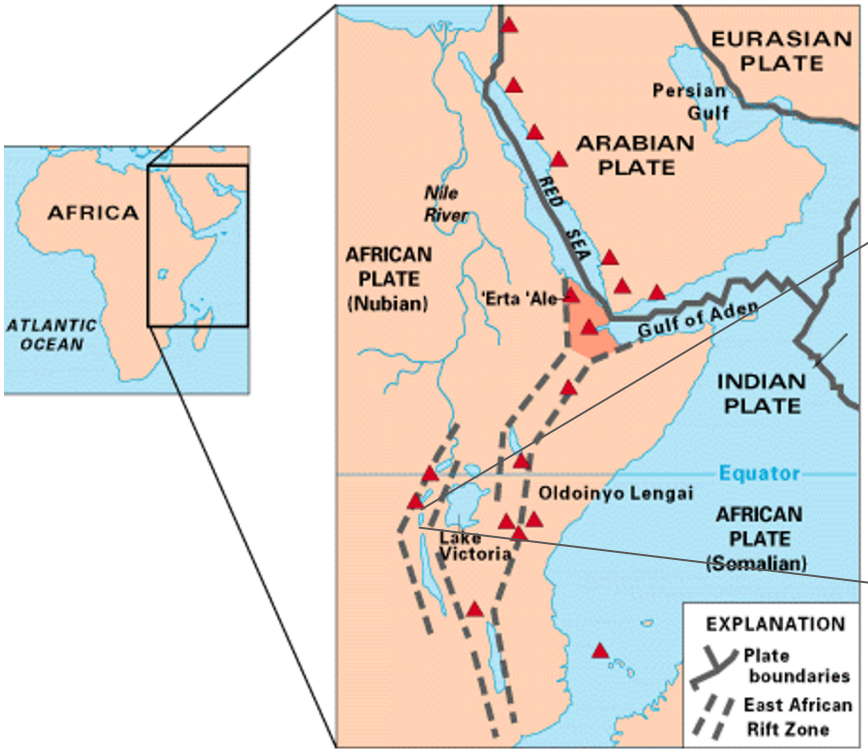


Initial Geophysical Characterization of Crustal Deformation Following the May 2021 Nyiragongo Eruption

D. Murekezi [1], A. Newman [1], C. Wauthier [2], C. Ebinger [3], J Gonzalez Santana [2], P Lundgren [4]

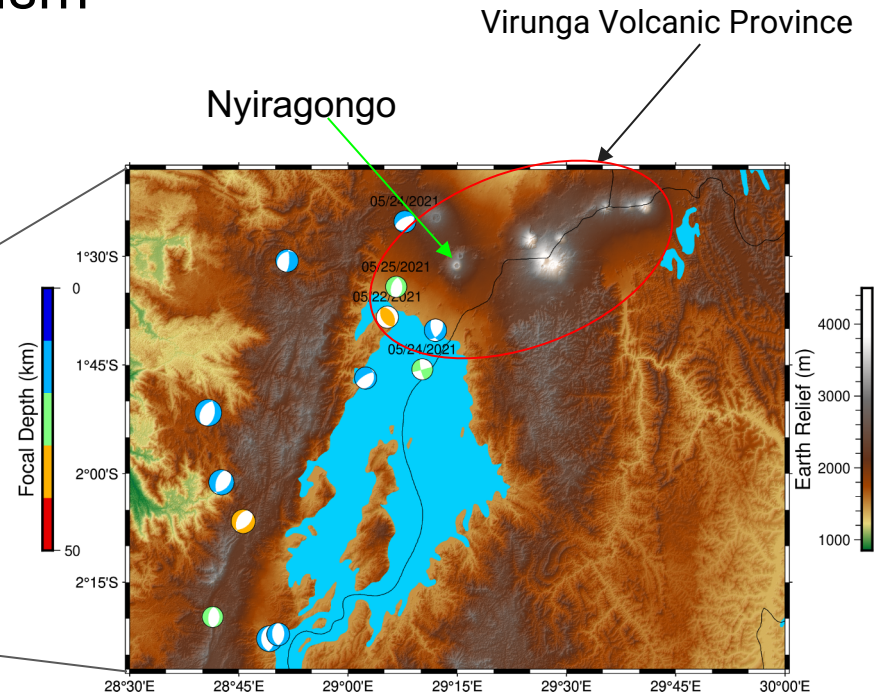
1: Georgia Institute of Technology 2: Pennsylvania State University 3: Tulane University 4: Jet Propulsion Laboratory, Caltech

East African Rift System and Volcanism

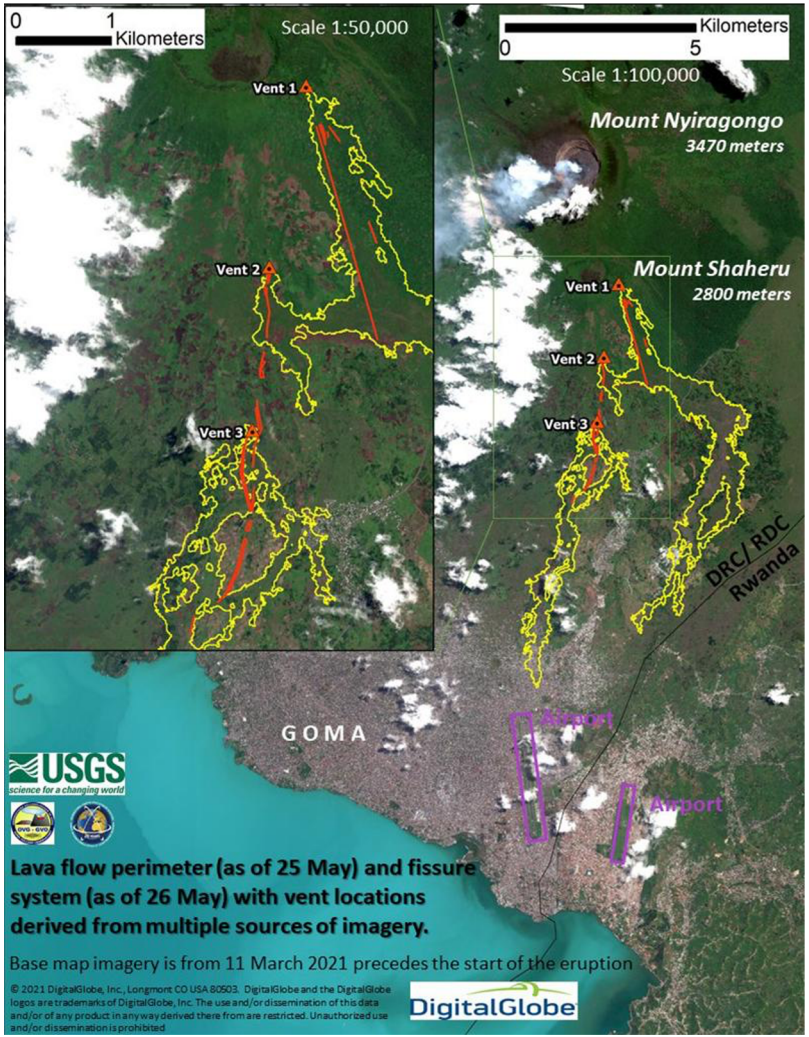


Branches of the East African Rift System

Source : USGS



Kivu Rift System and 2002-2021 Seismicity


0 1 Kilometers
Scale 1:50,000
Vent 1
Vent 2
Vent 3
0 5 Kilometers
Scale 1:100,000
Mount Nyiragongo
3470 meters
Mount Shaheru
2800 meters
Vent 1
Vent 2
Vent 3
DRC/ RDC
Rwanda
GOMA
Airport
Airport
USGS
science for a changing world
Lava flow perimeter (as of 25 May) and fissure system (as of 26 May) with vent locations derived from multiple sources of imagery.
Base map imagery is from 11 March 2021 precedes the start of the eruption
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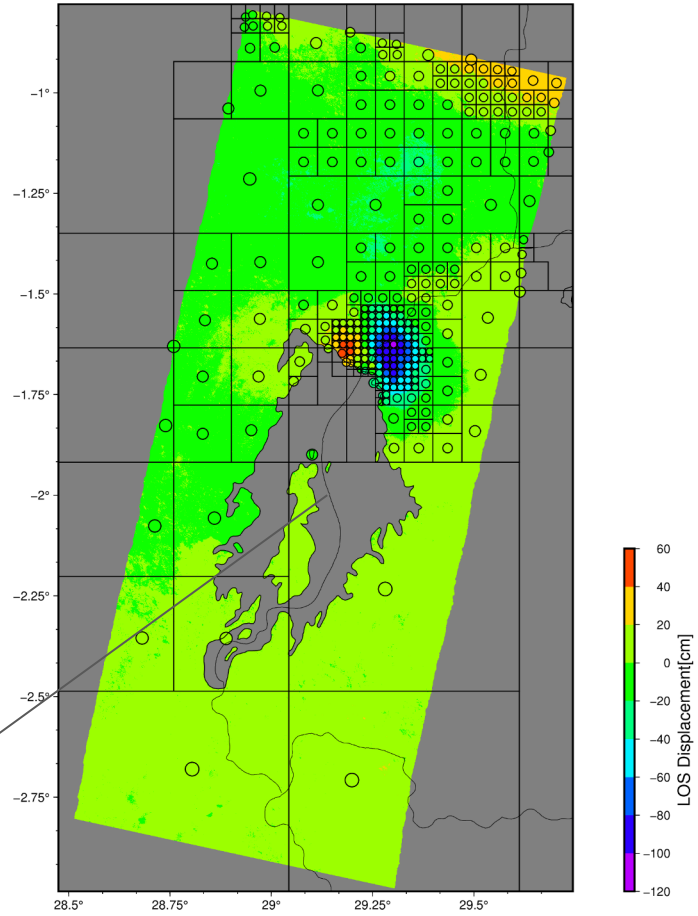
Interferogram Subsampling

- We used a Quadtree technique to subsample the InSAR interferogram with position determined by center-of-mass of data
- We used the subsampled LOS displacement data to invert for the extent of ground opening due to the dike intrusion
- Inversion was computed using *GTDef*, a linear least squares inversion of weighted data



N-S Dike Intrusion

- Most deformation appears to be on the Rwandan side
- InSAR data shows maximum 6 m of opening in the area of most deformation
- More than 2 m of opening for over 15km length
- Opening appears more shallow (2 km) in the north than in the south (3 km)