

# Validation of GGMplus and CHGeo2004 Using Observed Deflection of the Vertical Data from QDaedalus and CODIAC Systems in the Mountainous Terrain of the Surses Region, Switzerland

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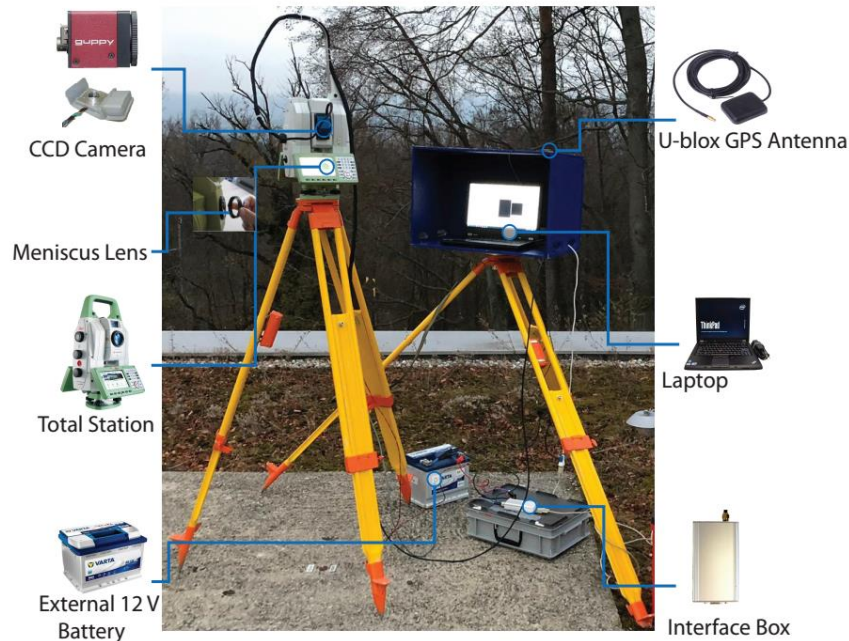
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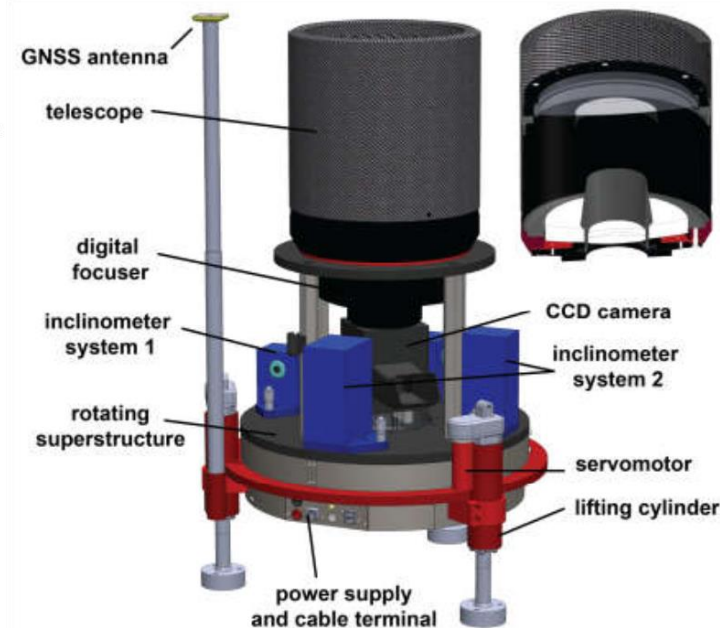
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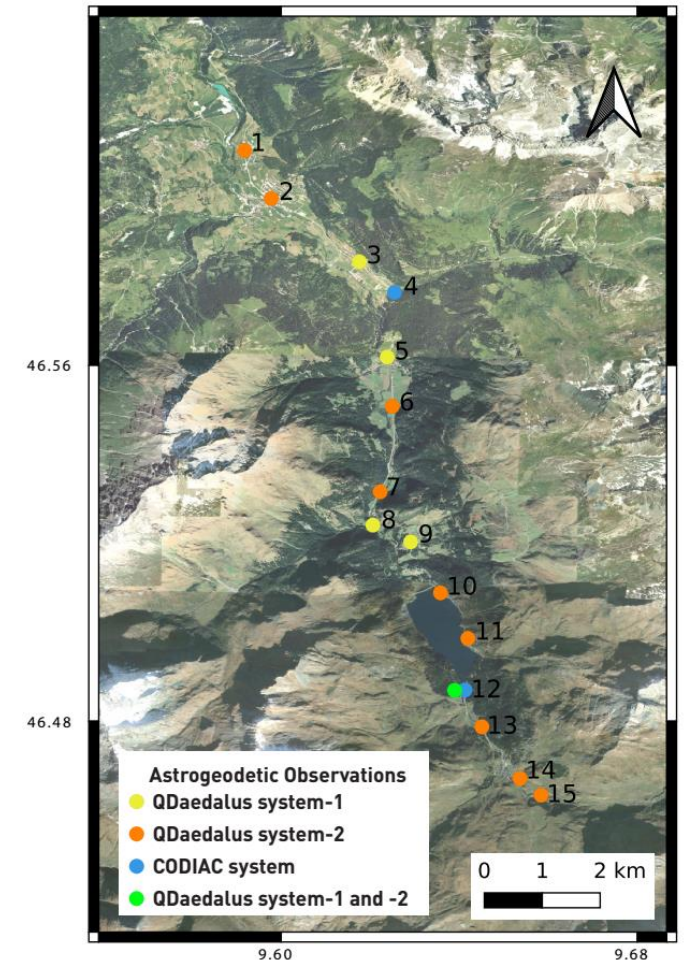
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TS60-based QDaedalus system (x2)  
Accuracy of 0.1", 30° Zenith Angle (ZA)

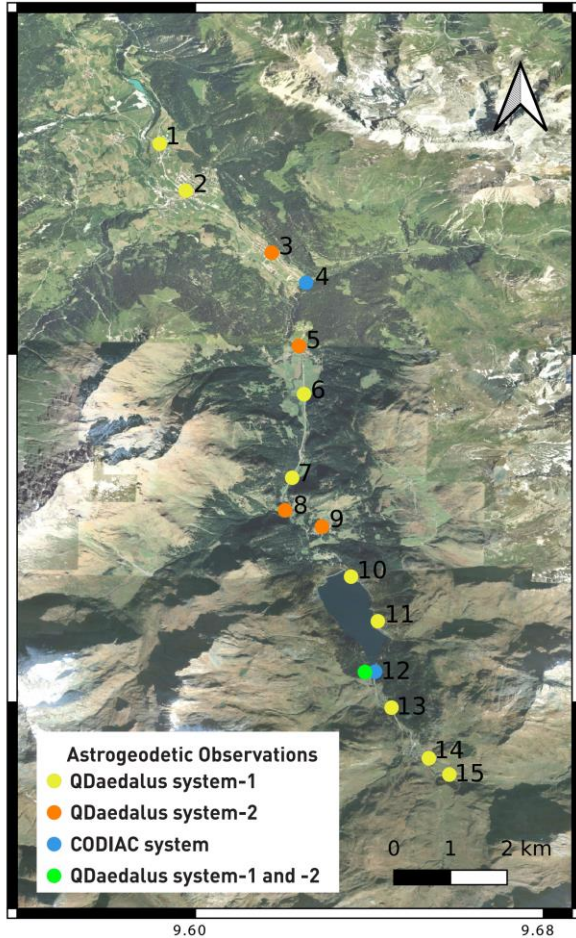


Zenith telescope-based CODIAC system  
Accuracy of 0.05", 0° ZA

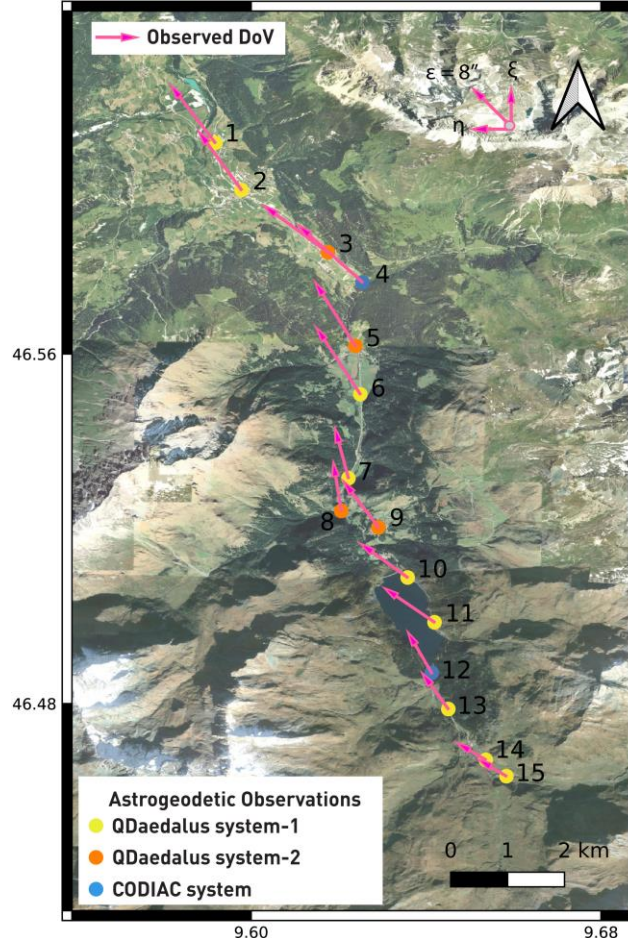




# DoV comparisons between observed and derived DoV data in the Surses Region

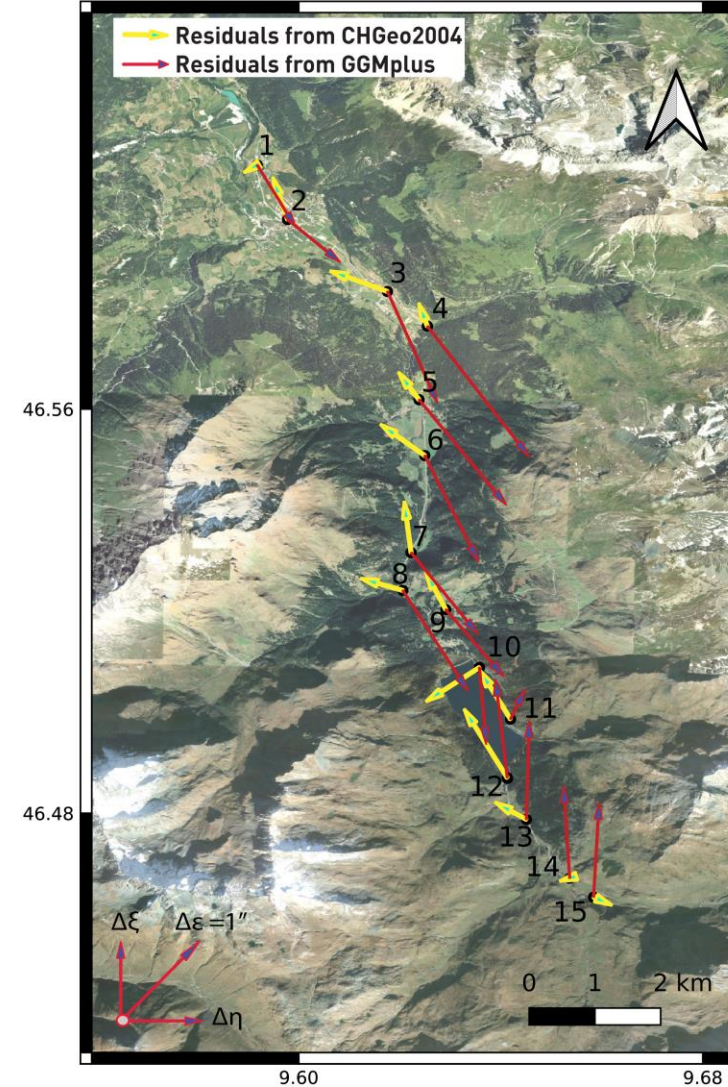


13 BM obs. with the QDaedalus-1 or -2  
1 BM obs. with the CODIAC  
1 BM obs. with all three systems



SDs of the QDaedalus data  
 $\xi$  &  $\eta$  :  $0.04''$ - $0.22''$

SDs of the CODIAC  
 $\xi$  &  $\eta$ :  $0.02''$ - $0.04''$



Residuals from GGMplus  
 $\Delta \xi$ :  $-2.31''$  to  $1.75''$   
 $\Delta \eta$ :  $-0.27''$  to  $1.80''$

Residuals from CHGeo2004  
 $\Delta \xi$ :  $-0.60''$  to  $1.21''$   
 $\Delta \eta$ :  $-1.01''$  to  $0.32''$

The predicted DoV data from CHGeo2004 are closer to the observed DoV and more accurate than GGMplus.



# GGMplus residuals comparison with previous studies

## Residuals from GGMplus and QDaedalus

Coastal terrain (Istanbul) for 15 BMs

$\Delta\xi$ : 2" and 6"

$\Delta\eta$ : > 2" at 3 BMs

Smooth terrain (Munich region) for 10 BMs

$\Delta\xi$  &  $\Delta\eta$ : ~0.2"

Reaches a maximum of 0.3" for  $\Delta\xi$  and 0.4" for  $\Delta\eta$

GGMplus is lower quality in mountainous terrain than in the smooth terrain of the Munich region.

GGMplus is higher quality in mountainous terrain than in the coastal terrain of Istanbul.



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