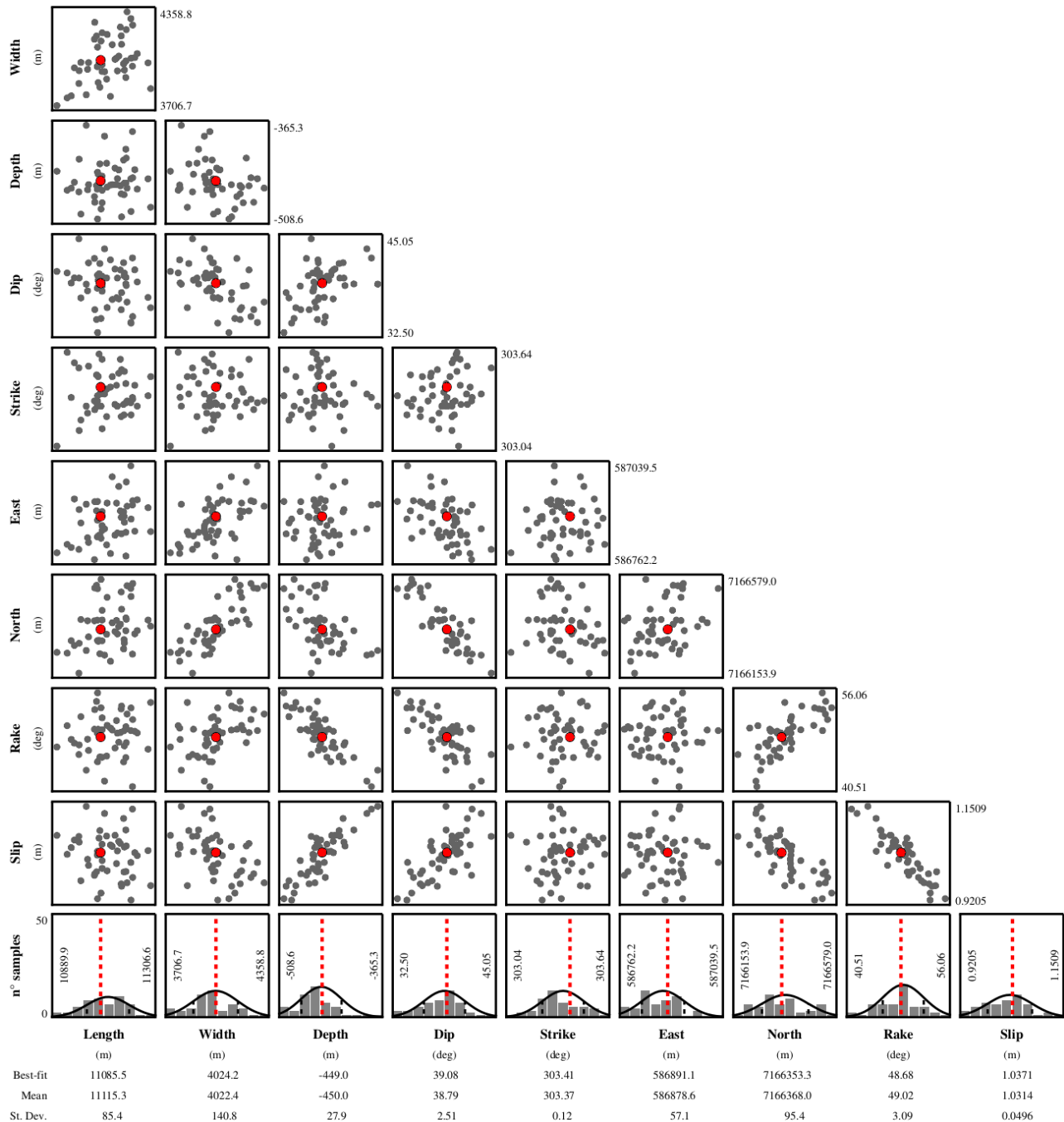


# SUPPLEMENTARY MATERIAL

Contents of this file: Figures S1, S2, S3 and S4 and TableS1

This supplementary material contains information related to the seismic source model shown in the manuscript. In particular, the performance of the source model are shown in Figure S1, while the focal mechanism of the seismic event retrieved by the model is reported in Figure S2. In figure S3 and S4 we show the results obtained by adding a second fault segments with the parameters shown in Table S1. We didn't prefer this model because of the relatively small improvement of the fit compared with the questionable reliability of the solution characterized by different faulting mechanism of the two segments.



**Figure S1: Fault parameter uncertainties and trade-offs for the seismic source model of the 2016 Petermann Ranges earthquake retrieved by C- and L-band InSAR data. Histograms show the a-posteriori probability distribution of fault parameters, and scatterplots show trade-offs between parameters. Details on the estimation on these parameter can be found in Atzori et al., 2009.**



Figure S2: Focal Mechanism of the May 21st 2016 Petermann Ranges event retrieved by the InSAR data inversion

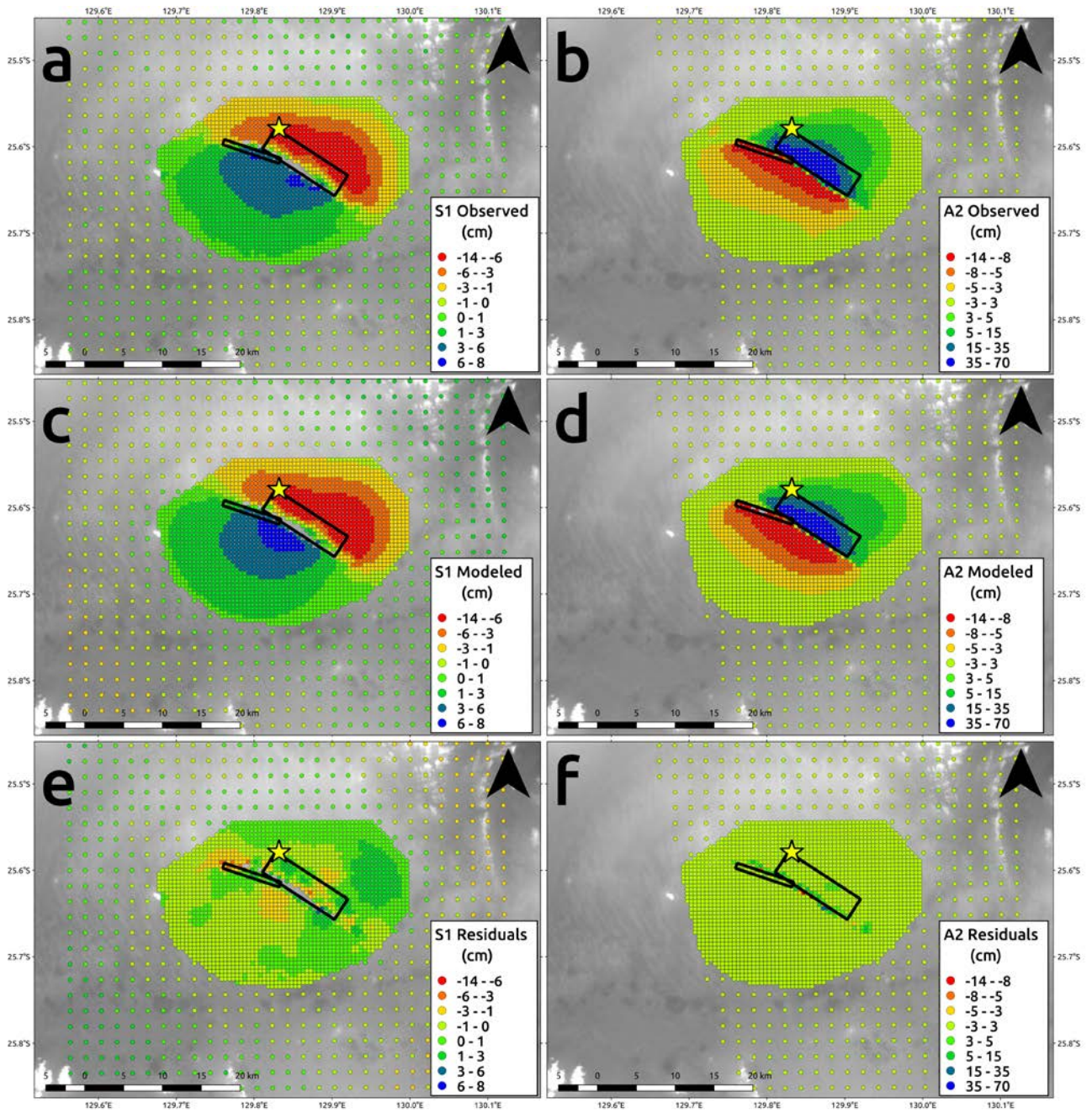
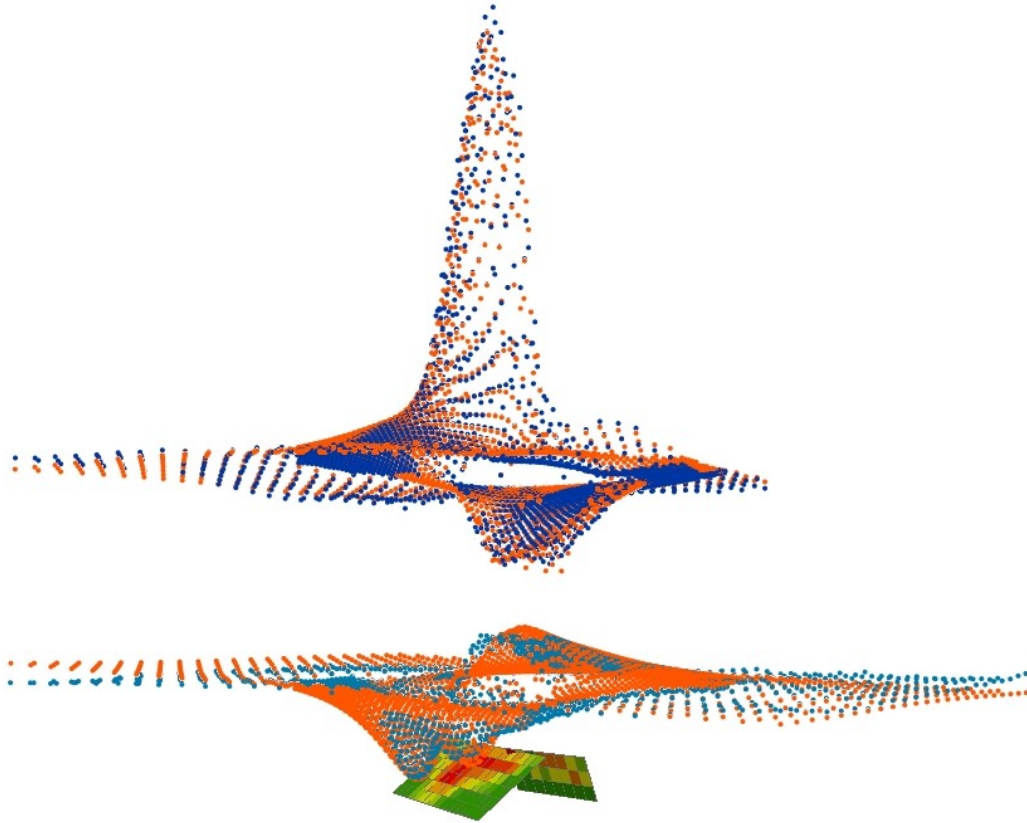


Figure S3: Results of InSAR data linear inversion obtained by adding a second fault segment: S1 observed (a), Modelled (c) and Residuals (e); ALOS-2 Observed (b), Modelled (d) and Residuals (f).

Parameter	Best-fit
Length (m)	7690
Width (m)	2000
Depth (m)	-702
Dip (deg)	69
Strike (deg)	108
Rake (deg)	-41

**Table S1: Parameters of the second fault segment**



**Figure S4: 3D Sketch of the seismic source retrieved by using 2 fault segments and relative fit between data (blue dots) and model (orange dots) for ALOS-2 (up) and Sentinel-1 (down) data.**

## REFERENCES

S. Atzori and 9 others, “Finite fault inversion of DinSAR coseismic displacement of the 2009 ’Aquila earthquake (Central Italy)”, *Geophysical Research Letters*, 36, 115305, 2009.