

Slip distribution of the 2020 Mw6.9 Samos Earthquake Using a Bayesian Approach

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Figure 1. (a) Seismic activity map between July 2007 and September 2012 (Tan et al., 2014). The white stars indicates the M>6 historical event locations (b) (Tan et al., 2014). The circles are M>5 and M>3 events occured in respectively 1911 and 1981.(c) Local seismicity map (Tan et al., 2014).

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Location distribution

* Clusters

Characterization of the faults

*Geometry



Slip distribution

*Static *Kinematic

Seismology

InSAR

GPS













* Clusters



Characterization of the faults

*Geometry



Slip distribution

*Static *Kinematic



30/10/2020 Mw6.9 Samos Earthquake



Figure 2. Location distributions and depth sections of October 30 Mw 6.9 Samos Earthquake and the aftershocks.

Green and blue circles are the catalog data from KOERI. Source mechanisms are remodeled form regional seismic waveforms (from DDA, KOERI and NOA Networks) by using BEAT (Vasyura-Bathke, et al., 2019, 2020). The green focal mechanism solutions from Karakostas et al., 2021.

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Main Shock Focal Mechanism Solution



Figure 3. Waveform fits



AFAD	11:51:23	37.888	26.777	16.54	6.6	270 46	-91	95	43	-87
GFZ	11:51:27	37.900	26.820	15.00	7.0	272 48	-93	97	41	-85
GCMT	11:51:34	37.760	26.680	12.00	7.0	270 37	-95	96	53	-86
INGV	11:51:36	37.836	26.808	10.60	7.0	289 40	-69	82	53	-107
K0ERI	11:51:24	37.902	26.794	13.10	6.9	272 55	-93	97	84	-85
NOA	11:51:24	37.900	26.817	6.00	6.9	294 54	-65	76	43	-120
USGS	11:51:44	37.918	26.790	11.50	7.0	276 29	-88	93	61	-91
	11:51:24	37.897	26.759	13.33	6.9	265 47	-101	100	44	-80

Figure 4. Focal Mechanism Solutions of different agencies















* Clusters

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What are the GEOMETRY parameters?

As a first step of the study, rectangular source parameters were estimated by using GPS data. Figure 5 shows the examples of this step.





Figure 5. GNSS fits for different geometry



Length 35 km, width 15 km, dip 47, rake -101, constant slip 2.3 m



Figure 6. Slip distribution model of Samos Earthquake. Prepared by Ryo Okuwaki by using the method Shimizu et al., 2020. The fault planes are USGS W-phase Moment Tensor solution.

Ref. https://github.com/rokuwaki/2020Greece https://twitter.com/rokuwaki/status/1322697505499394048

What are the GEOMETRY parameters?

Slip



















Distance (km)

Depth (km)

GNSS Data

Slip Distribution

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- are important for the characterization of the fault structures in the area.
- with the tectonic regime of the region; we need more detailed bathymetry map.
- *We will also focus on the post seismic data analysis and rupture propagation with the kinematic slip distribution estimation.



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*This seismically active area is part of a N-S extensional regime and controlled primarily by normal fault systems and some of them have strike slip component because of counter clockwise rotation of Anatolia. Samos earthquake and the significant aftershock activity

*Although both seismology and geodesy data sets indicates reliable inputs for joint inversion and the proposed results are consistent







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