



CENTRO
OSSERVAZIONI
SPAZIALI
DELLA TERRA

Complex fault modeling of the 2023 Turkey-Syria events.

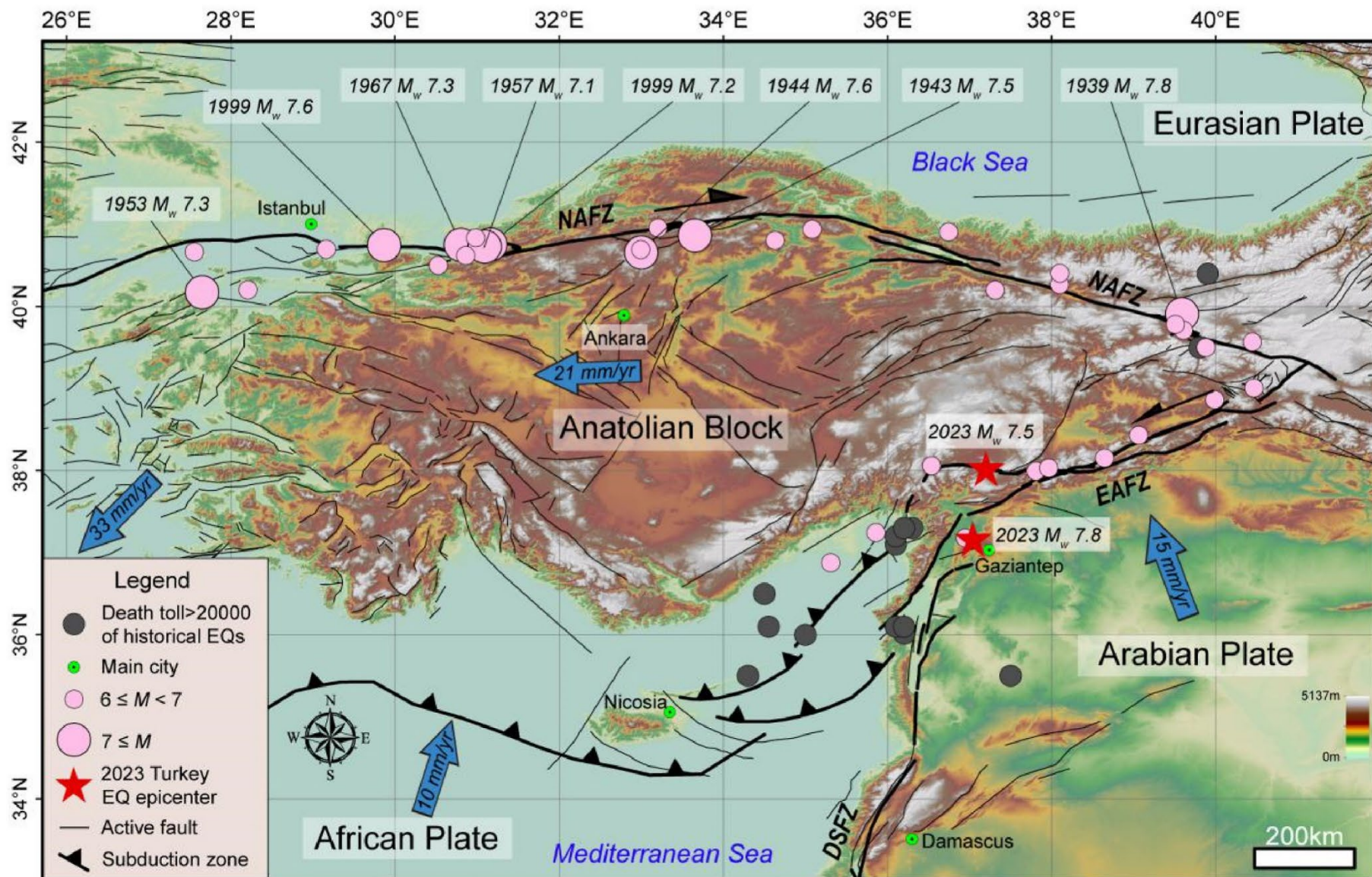
GEOSAR Lab (Albano M., Antonioli A., Atzori S., Beccaro
L., Bignami C., Moro M., Pezzo G., Polcari M., Salvi S.,
Stramondo S., **Svigkas N.**, Tolomei C.)

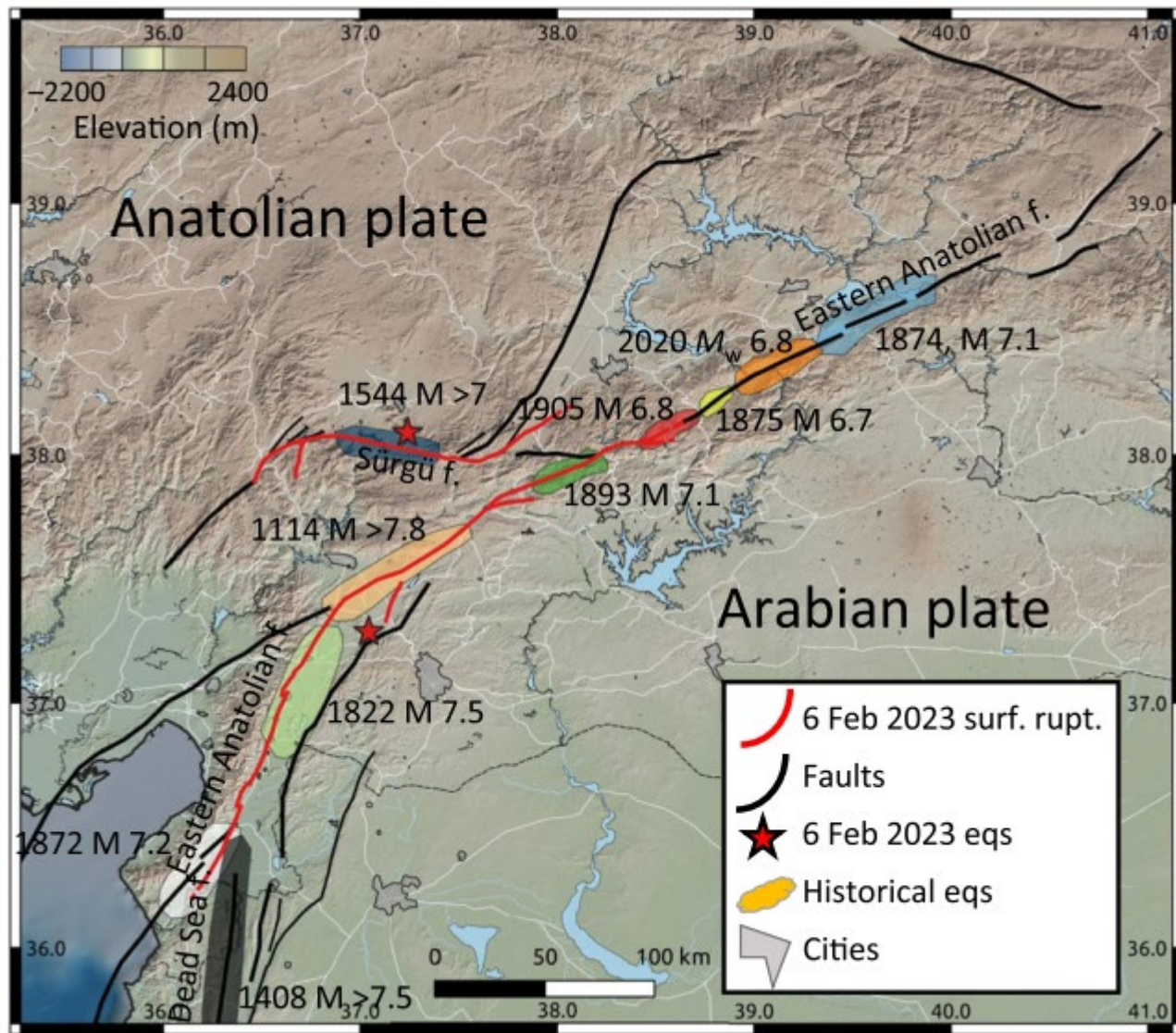
with contributions from CNR-IREA

Involved COS modules

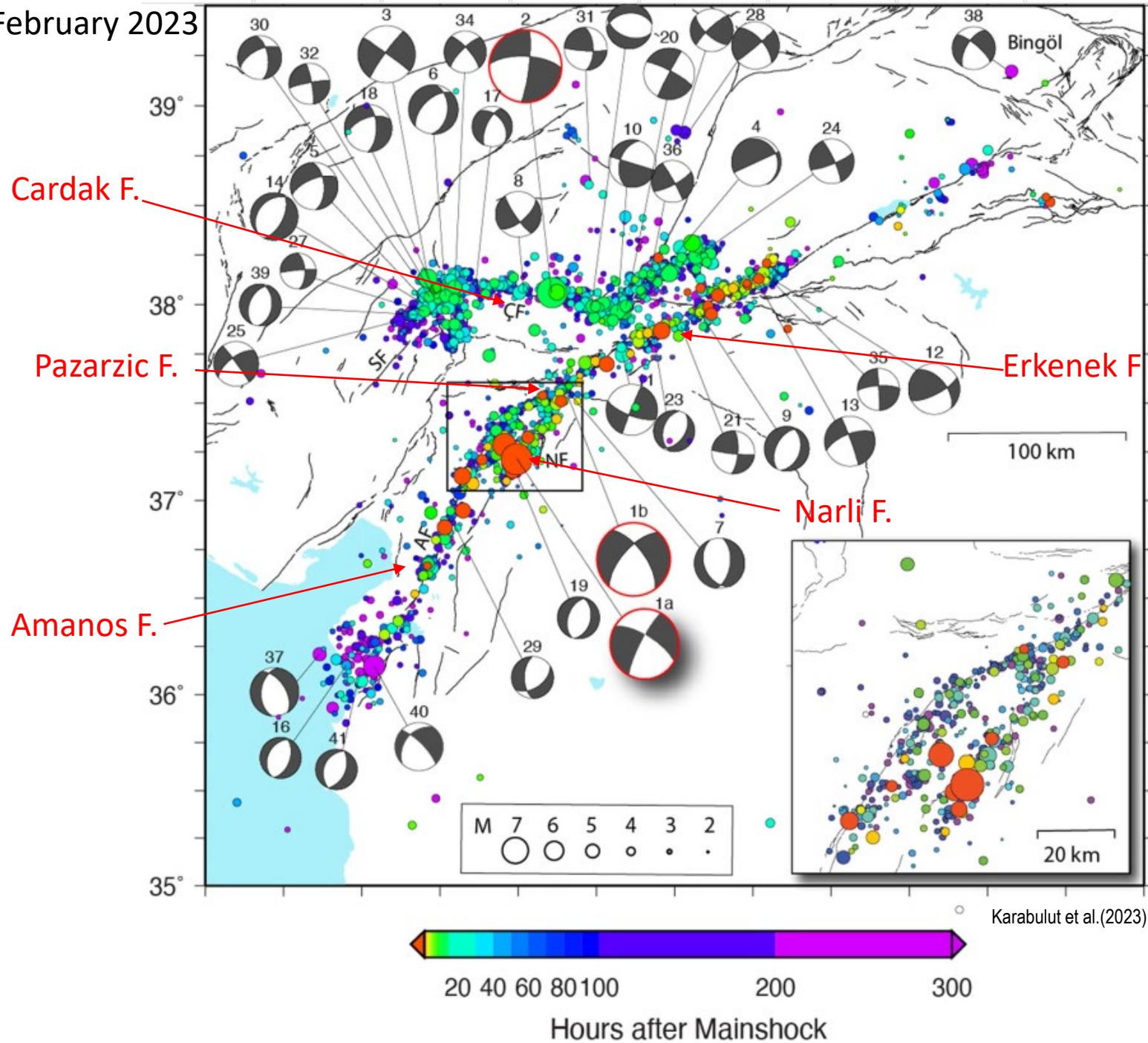
- SAR products
- Geodetic scenarios and modeling from geodetic data

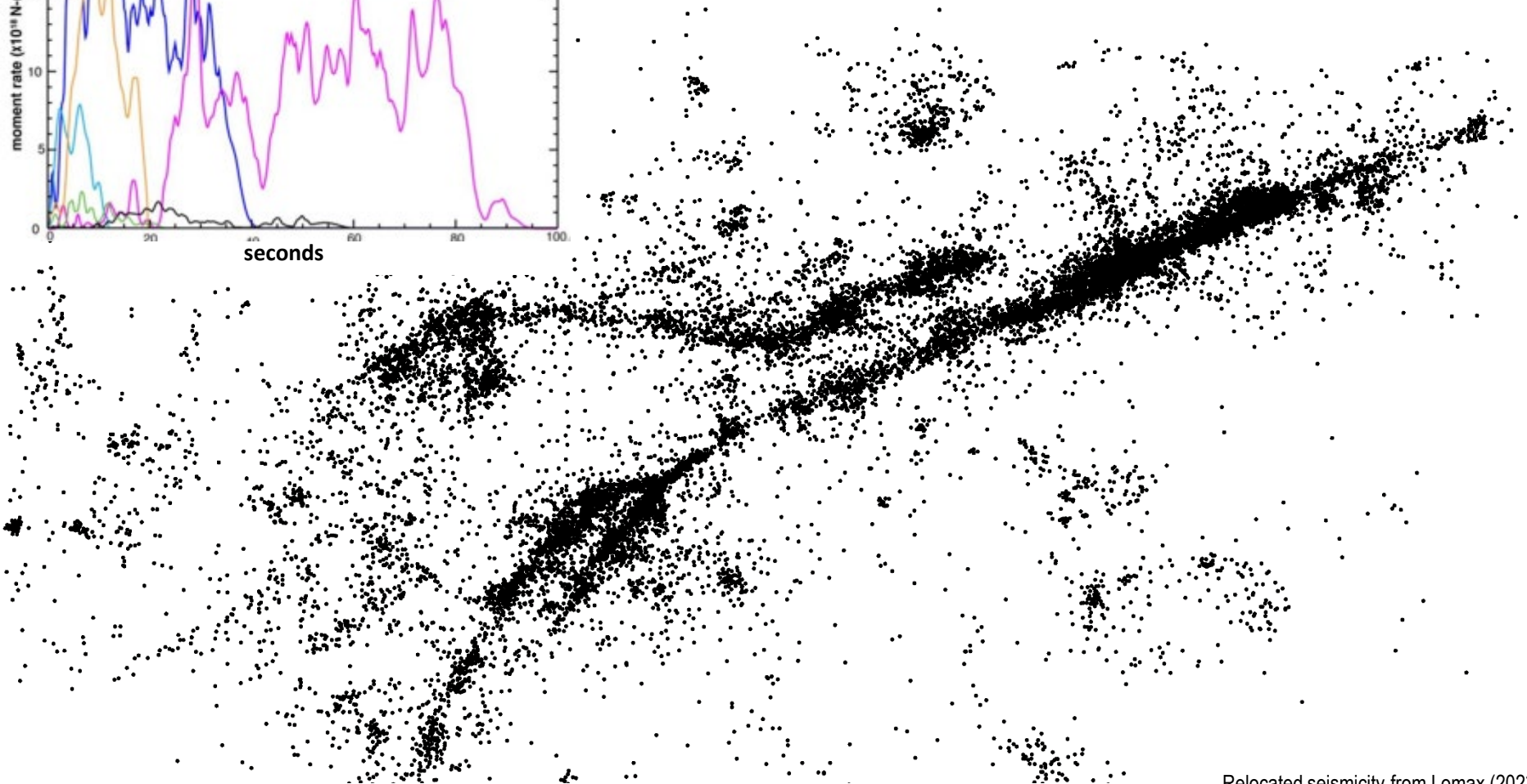
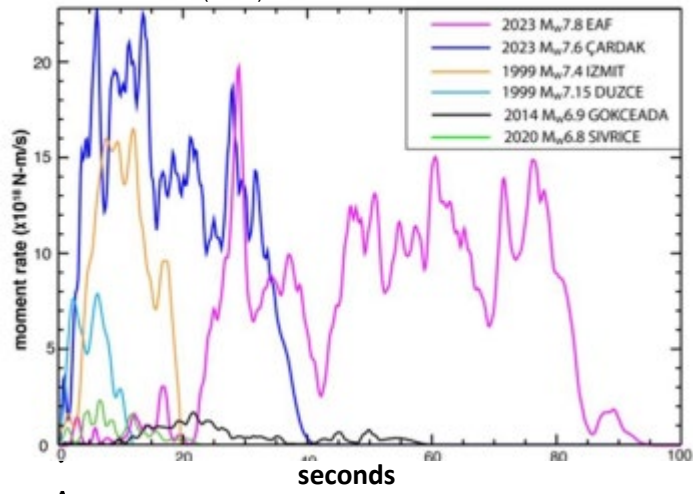
- 1990 Mw 7.8 Luzon, Philippines
- 2001 Mw 7.8 Kunlun, China
- 2002 Mw 7.9 Denali, Alaska
- 2013 Mw 7.7 Balouchistan, Pakistan
- 2016 Mw 7.8 Kaikoura, New Zealand

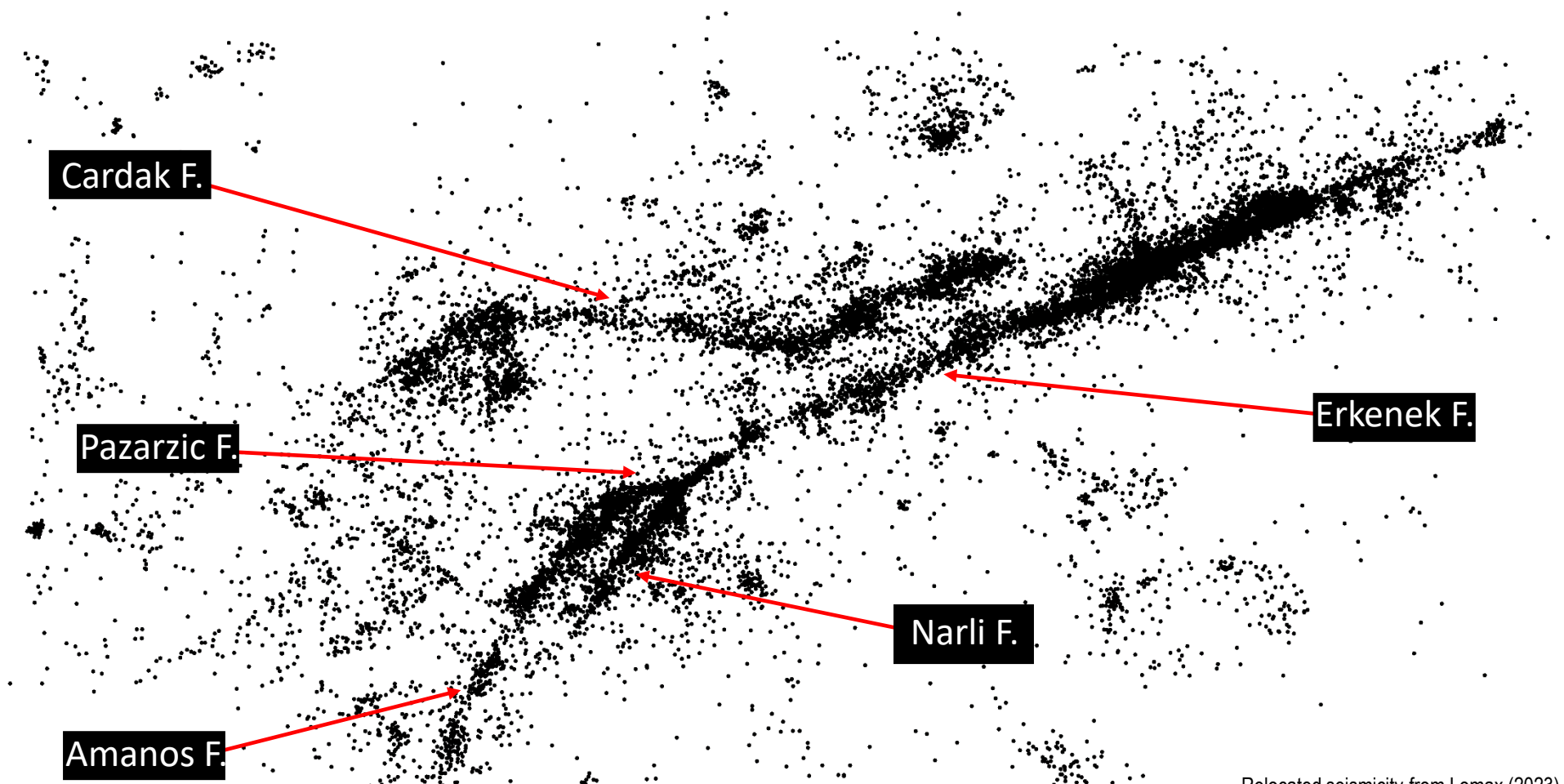




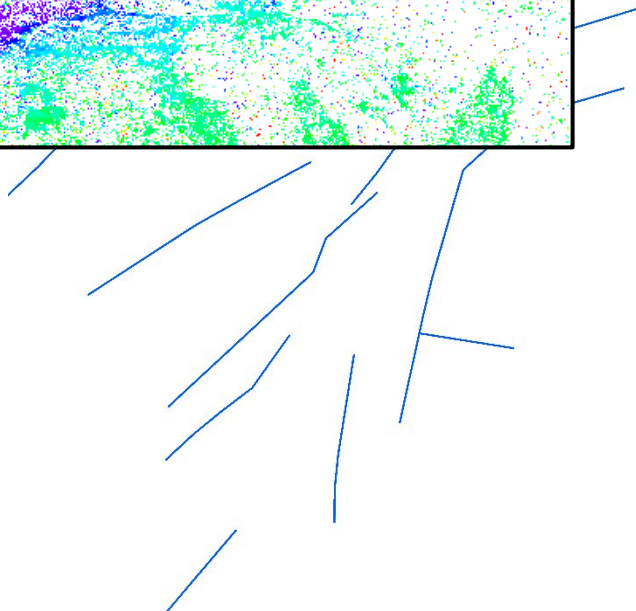
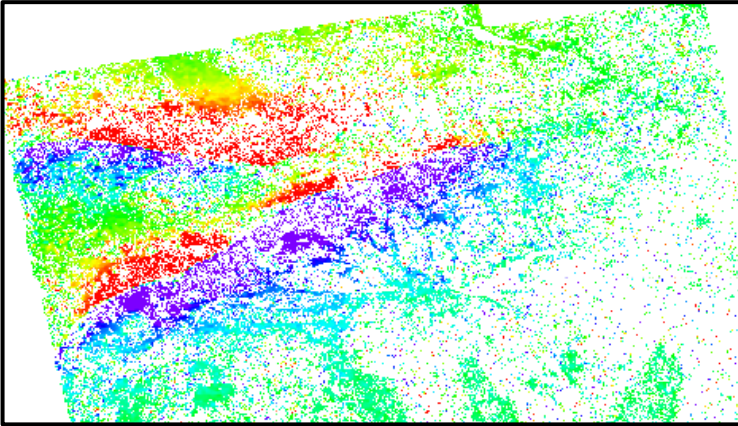
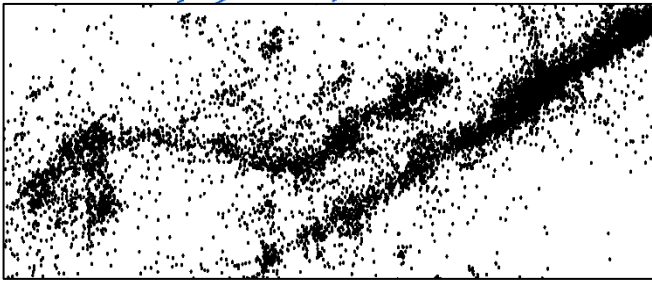
6 February 2023







Relocated seismicity from Lomax (2023)

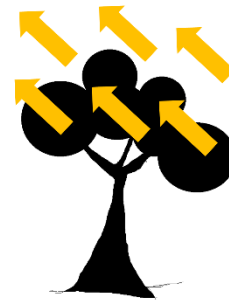


- Interferograms
- Focal mechanisms
- Seismicity
- Known fault traces

Sentinel-1



C-Band



ALOS-2



L-Band



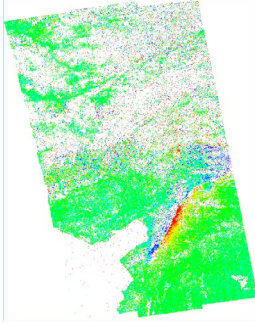
Track_14

Track_21

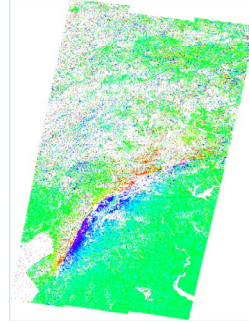
Track_116

Sentinel-1

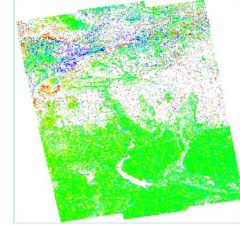
20230128_20230209_Asc_AZ



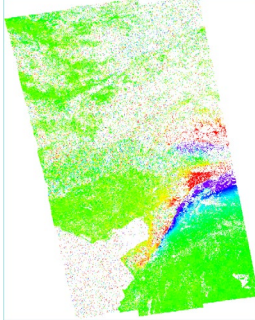
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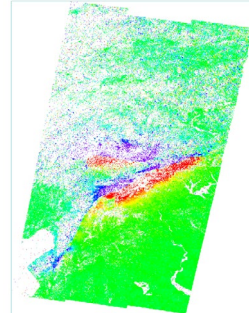
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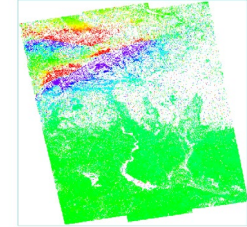
20230128_20230209_Asc_RG



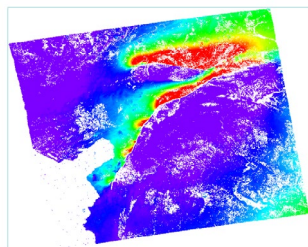
20230128_20230209_Desc_RG



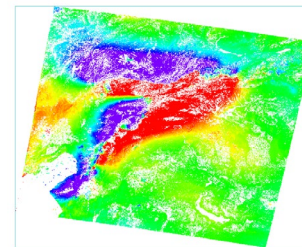
20230204_20230228_Asc_RG



20220905_20230220_Asc_LOS

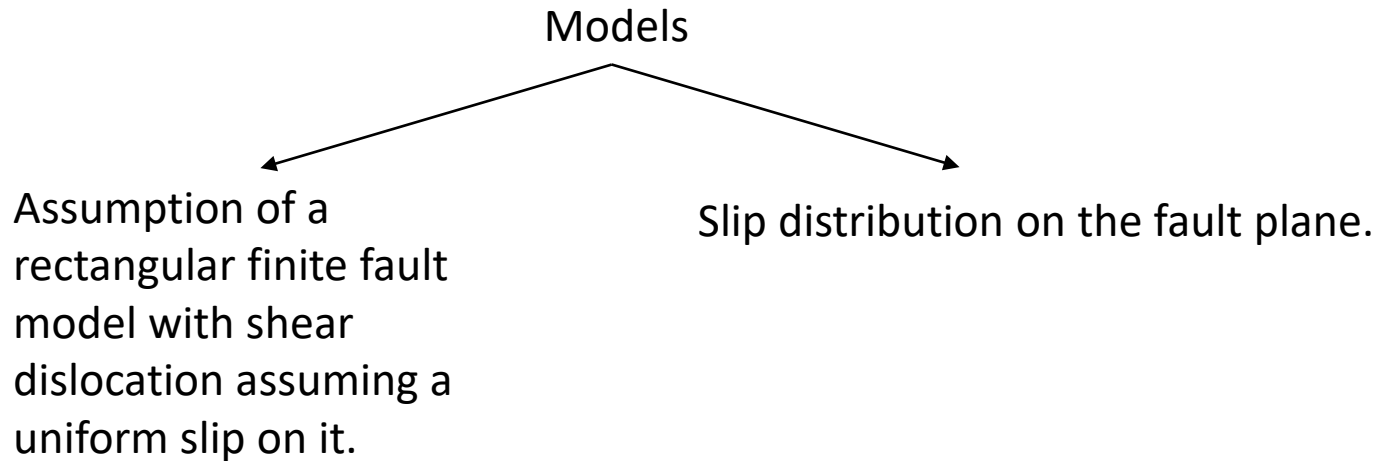


20220916_20230217_Desc_LOS

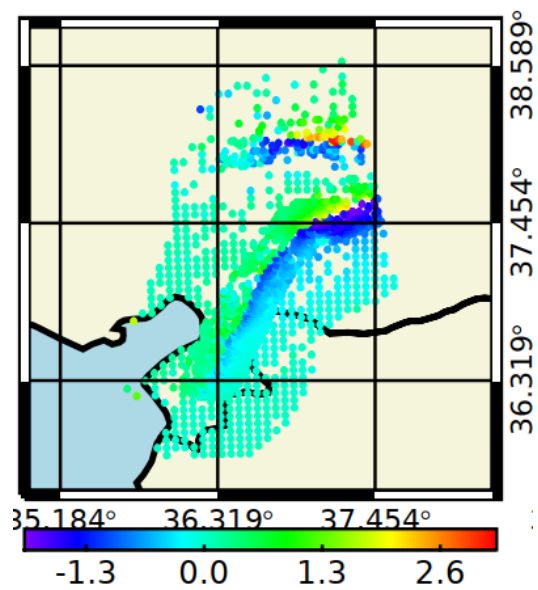
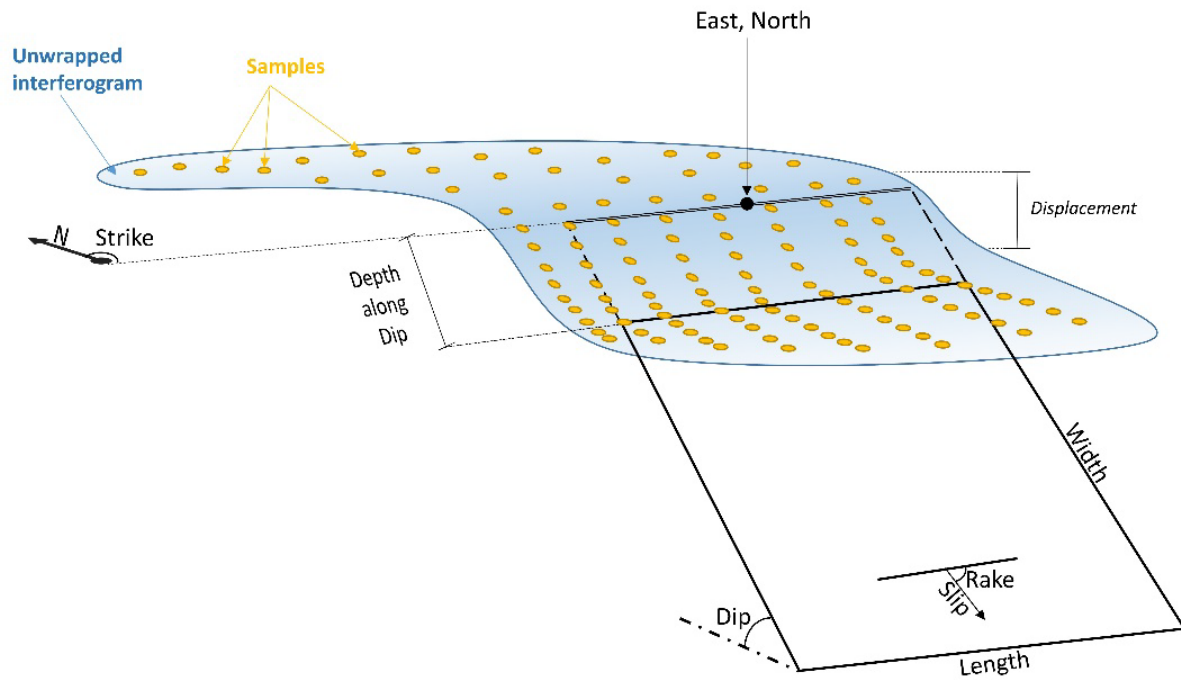


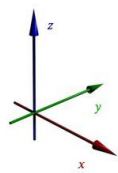
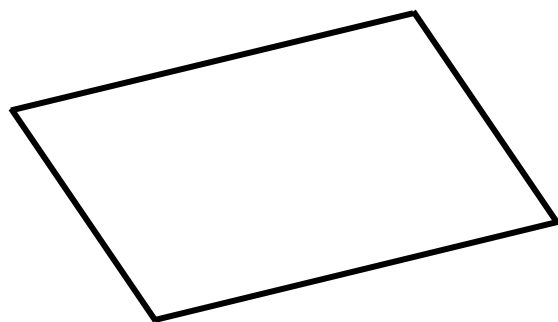
ALOS-2

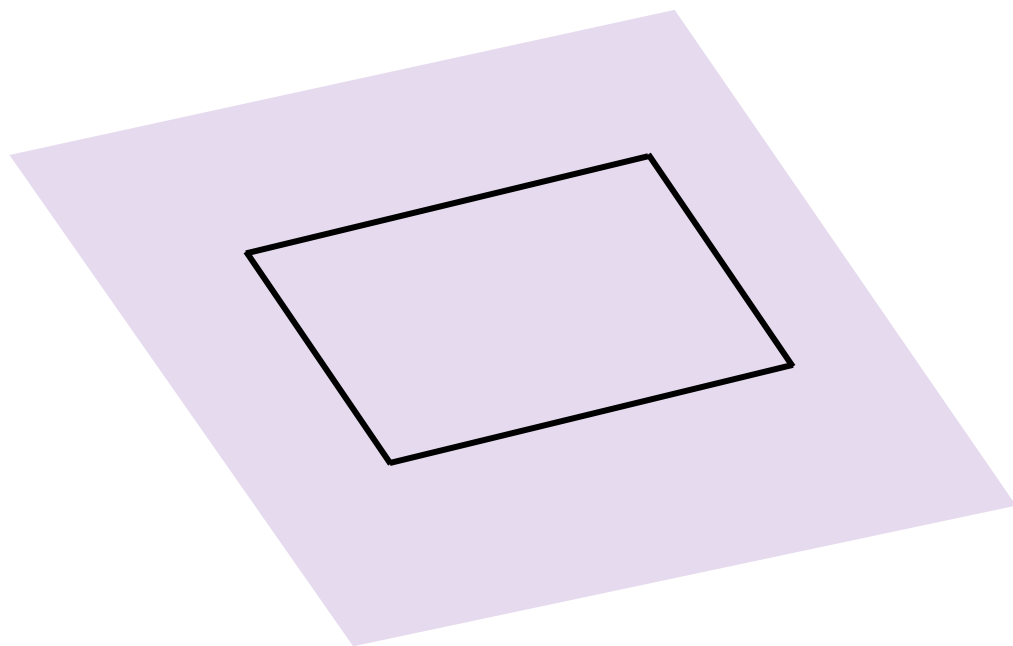
Optimum source model that predicts the detected deformation.

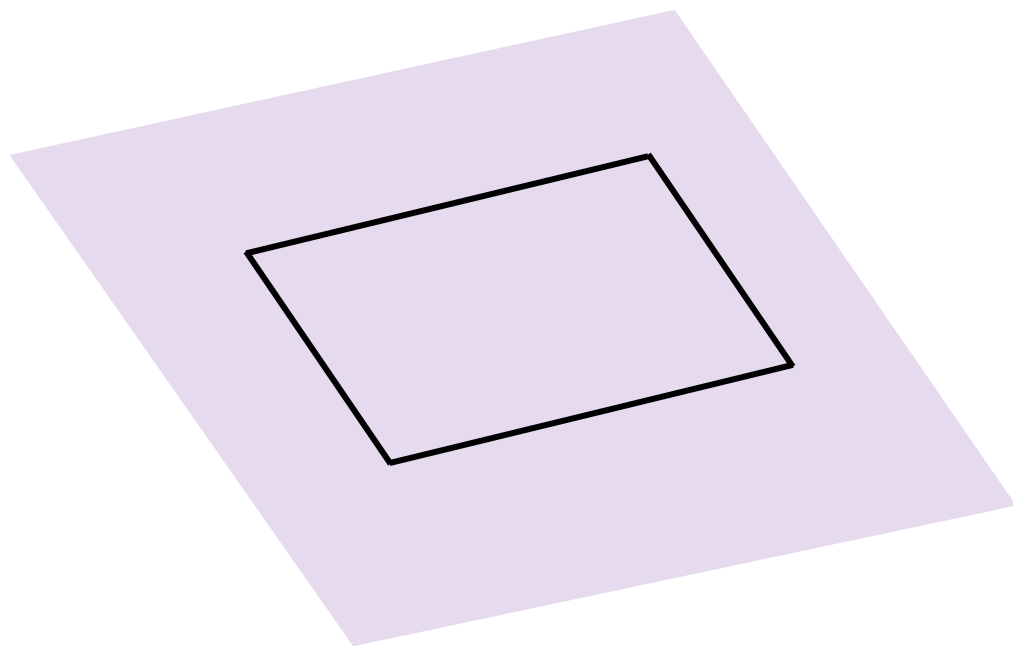


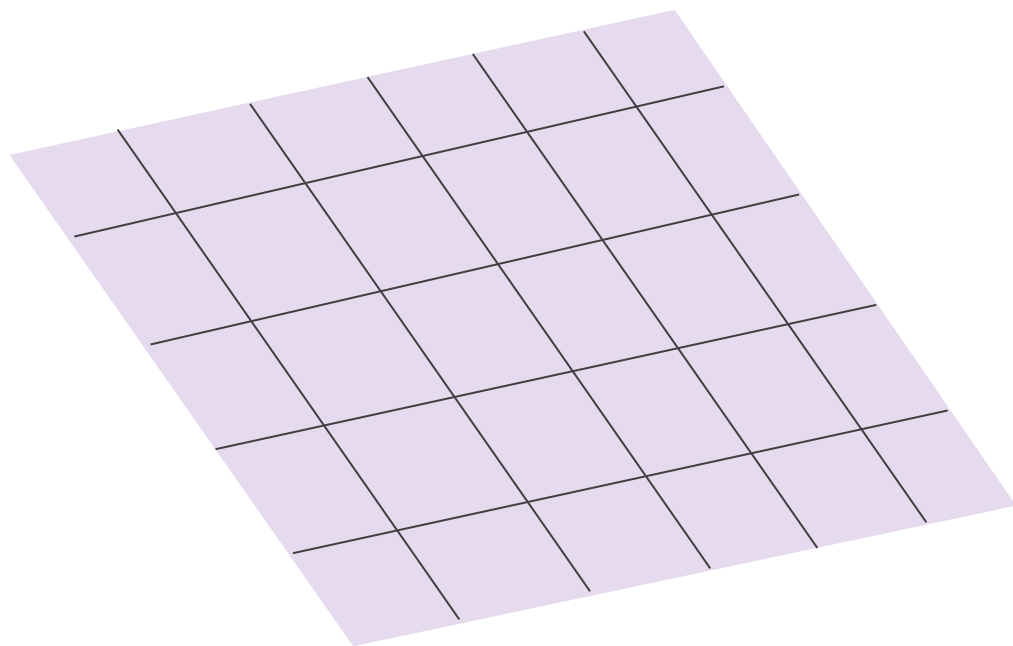
- Levenberg (1944) and Marquardt (1963)
- Okada (1985) formulation

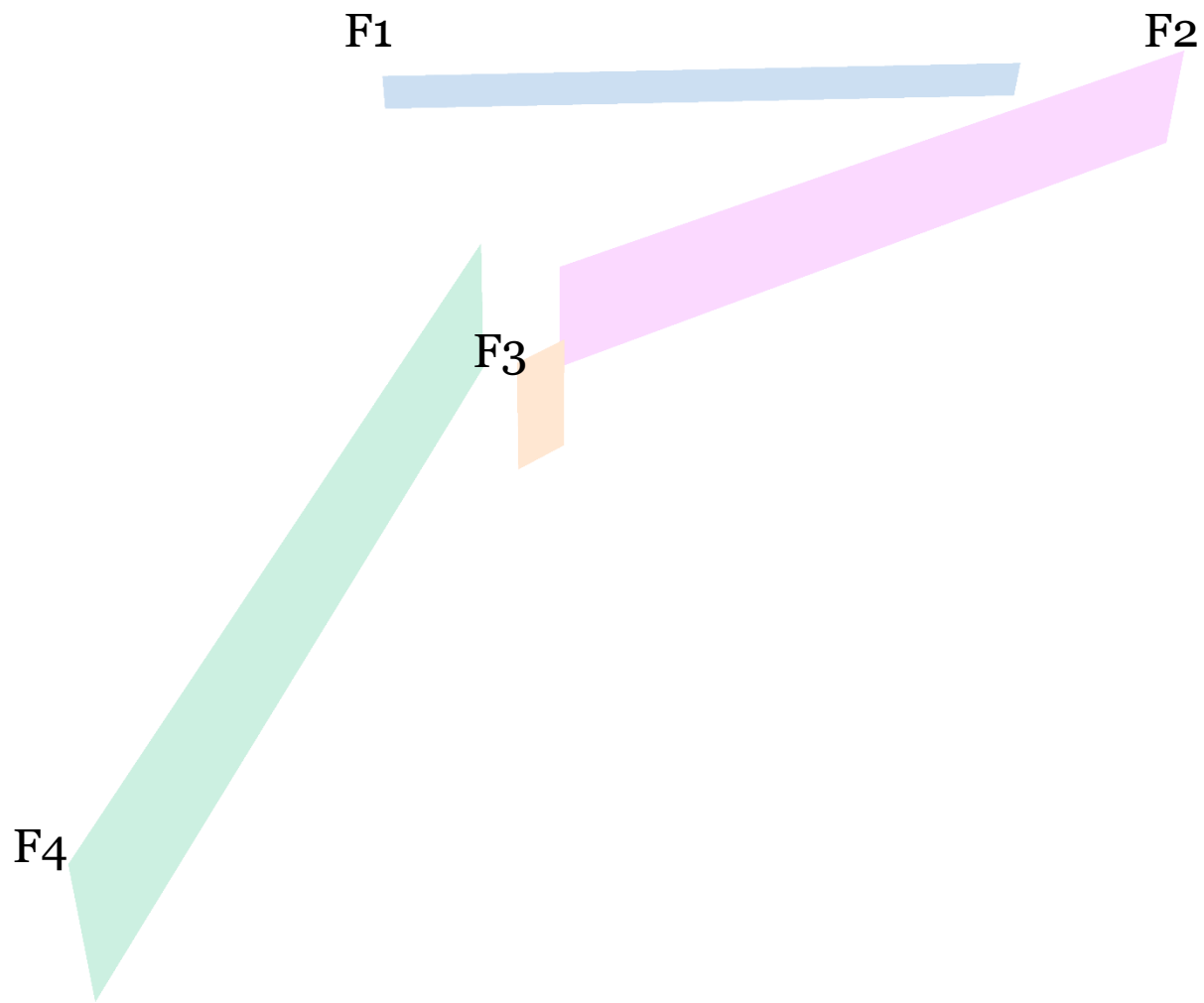


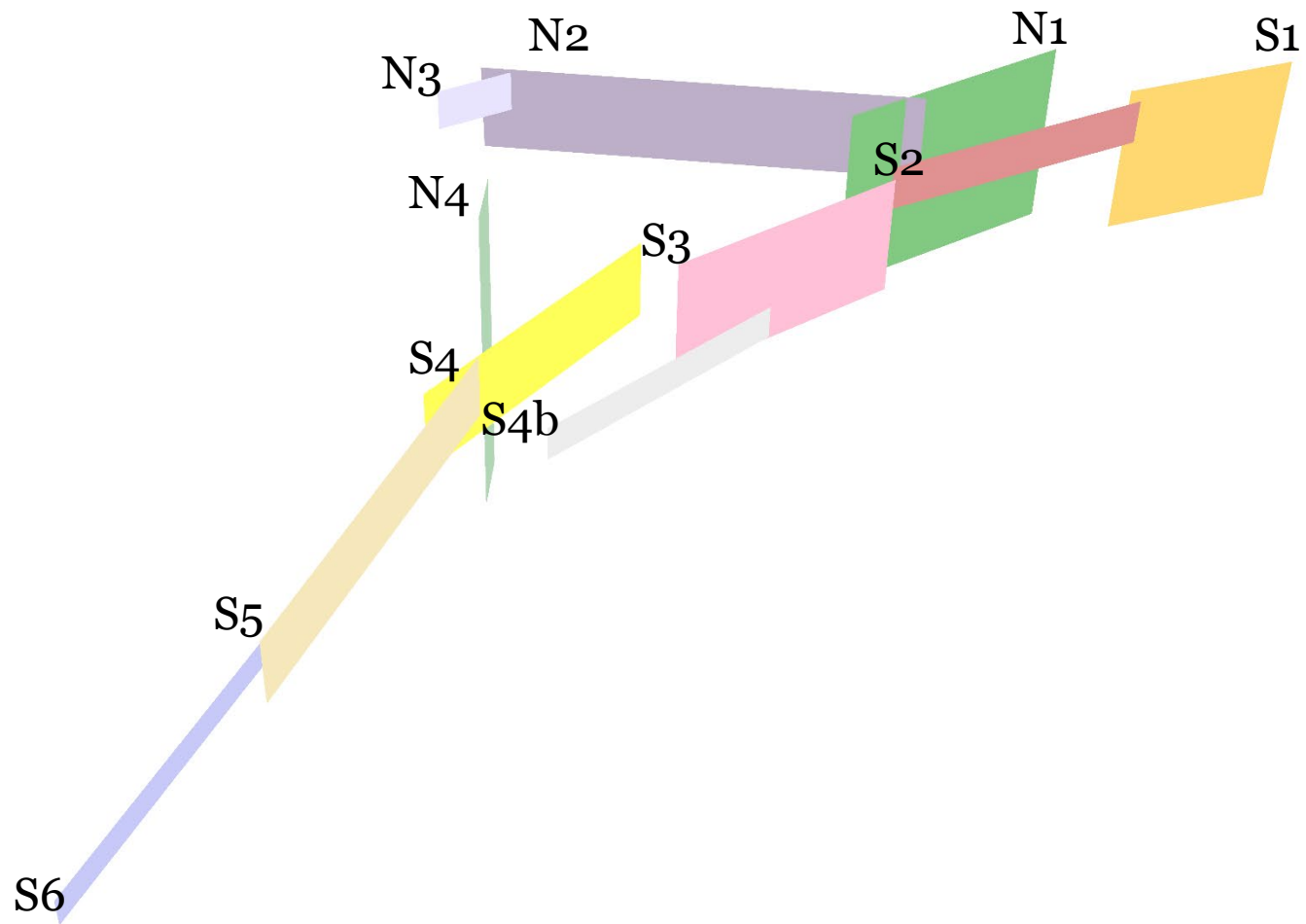


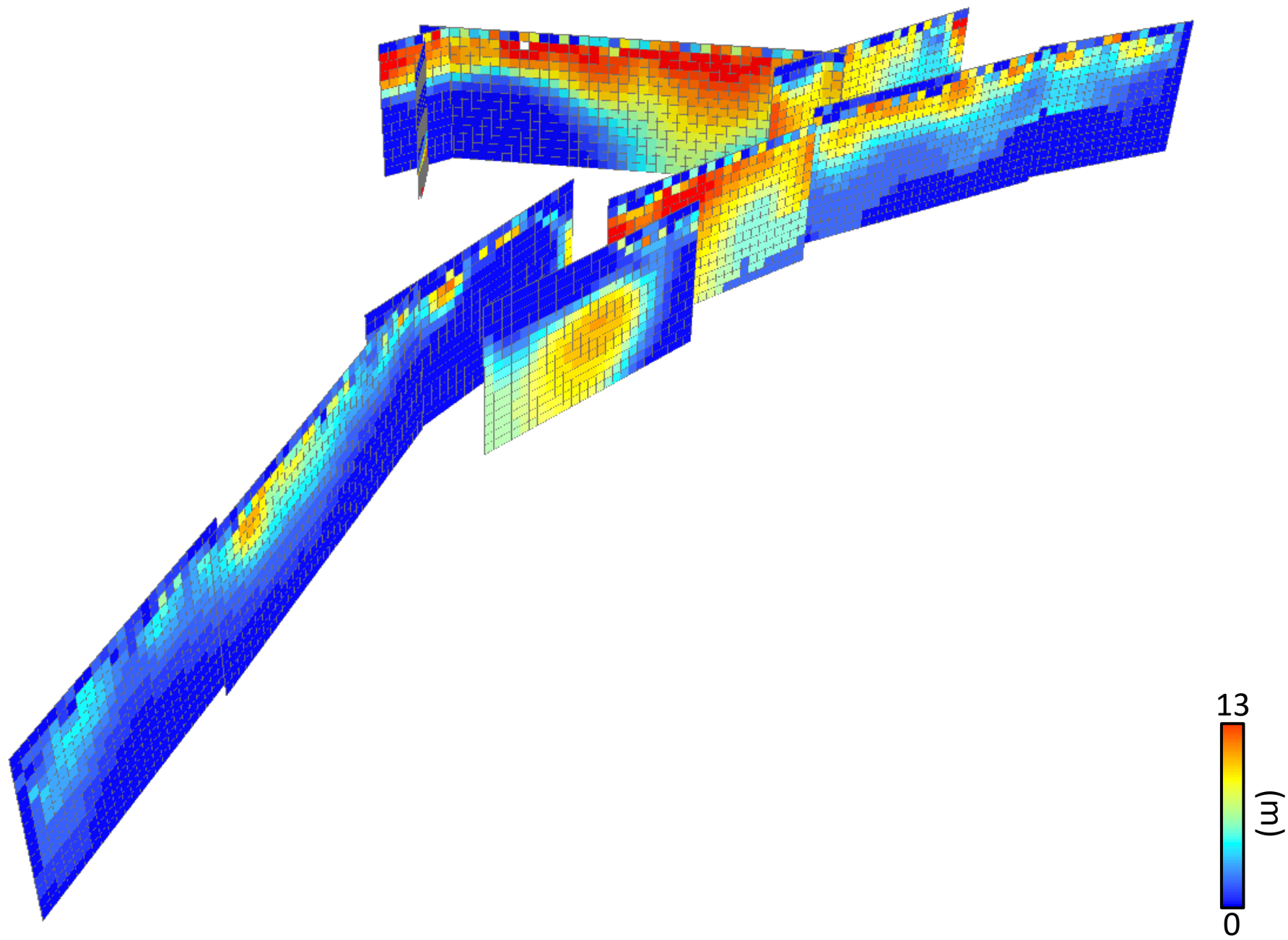




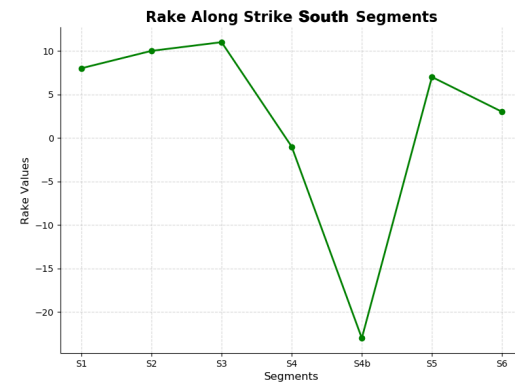
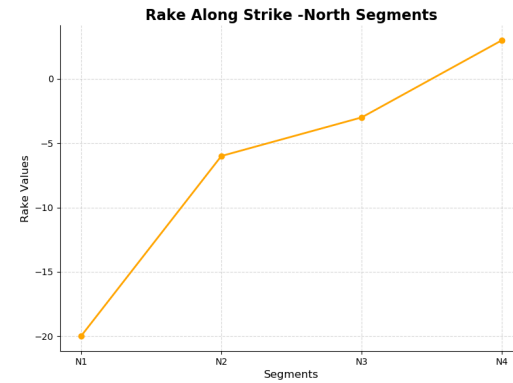
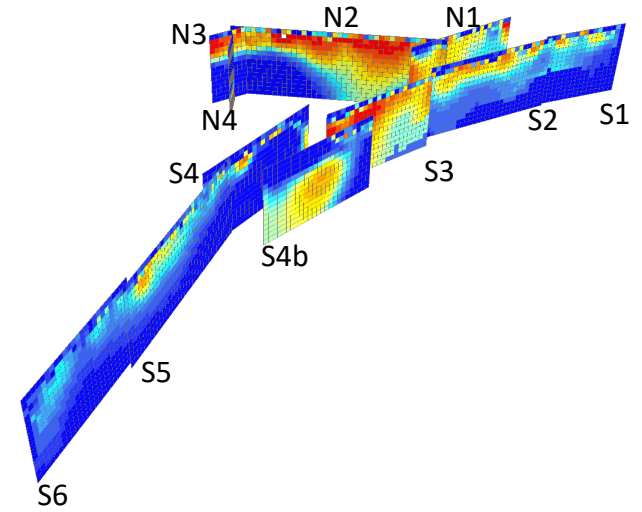
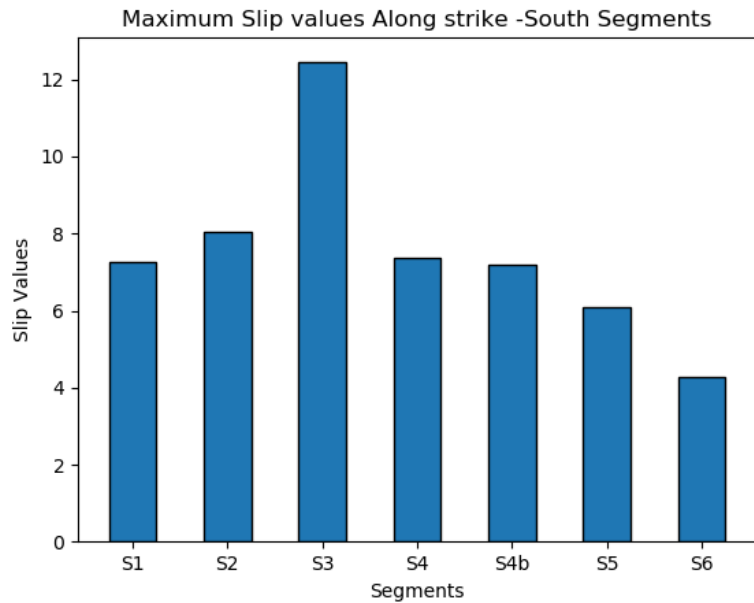
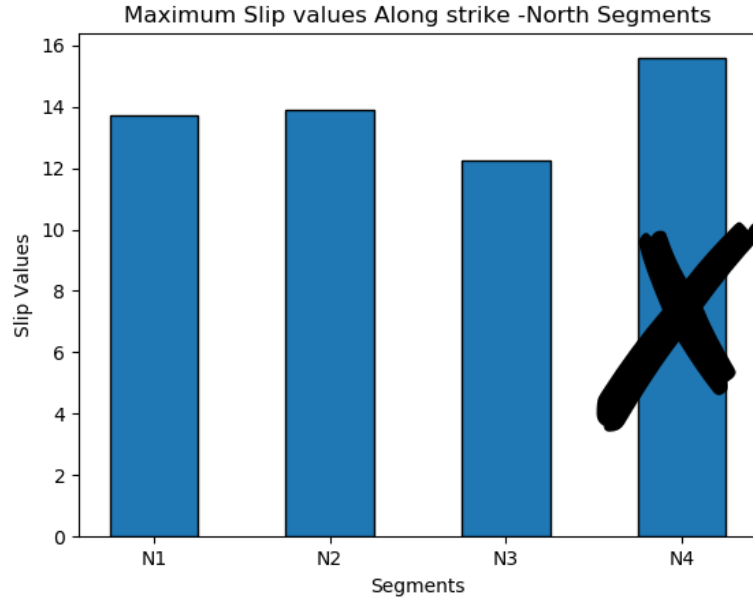






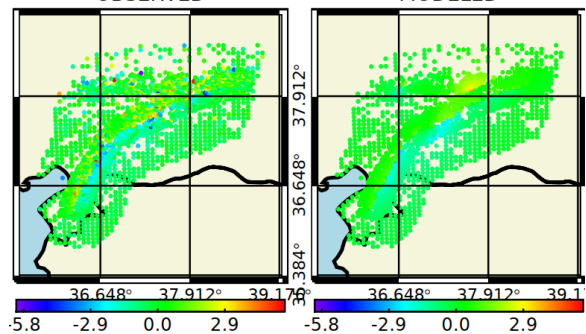


Moment Magnitude: 8.04



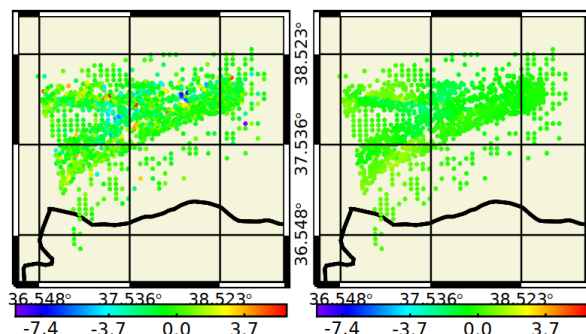
OBSERVED

MODELED



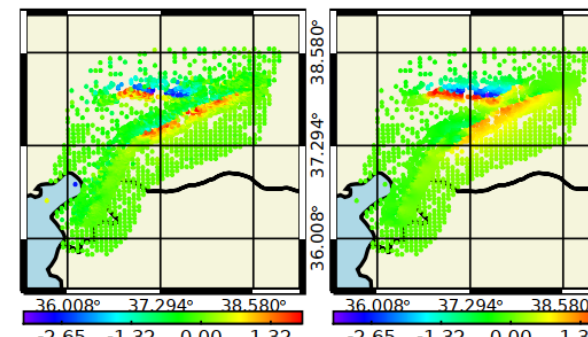
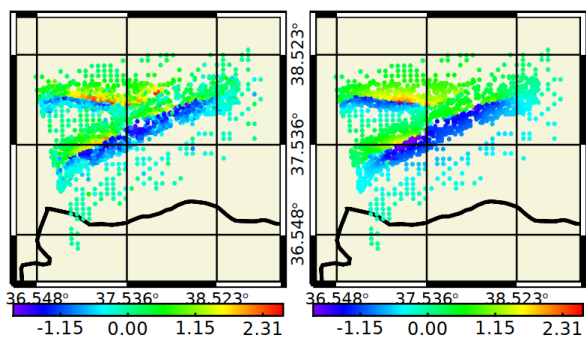
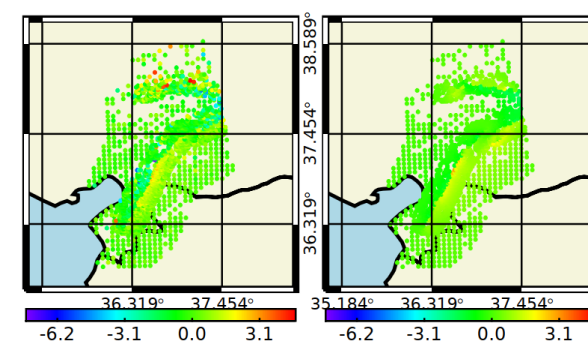
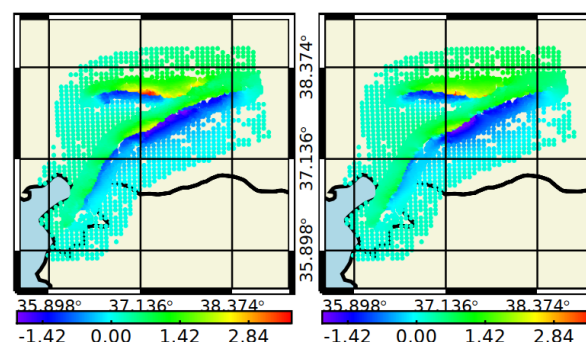
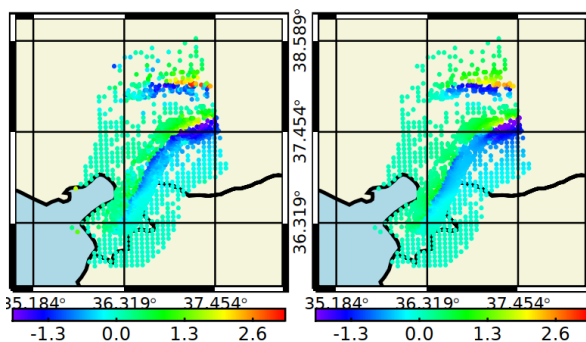
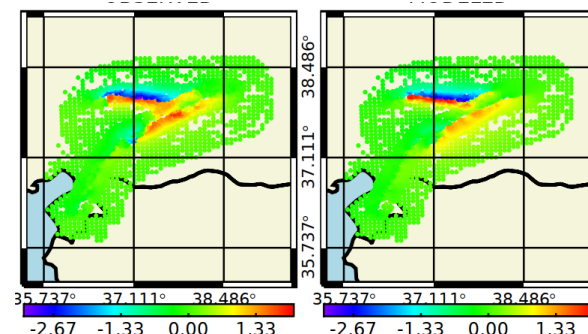
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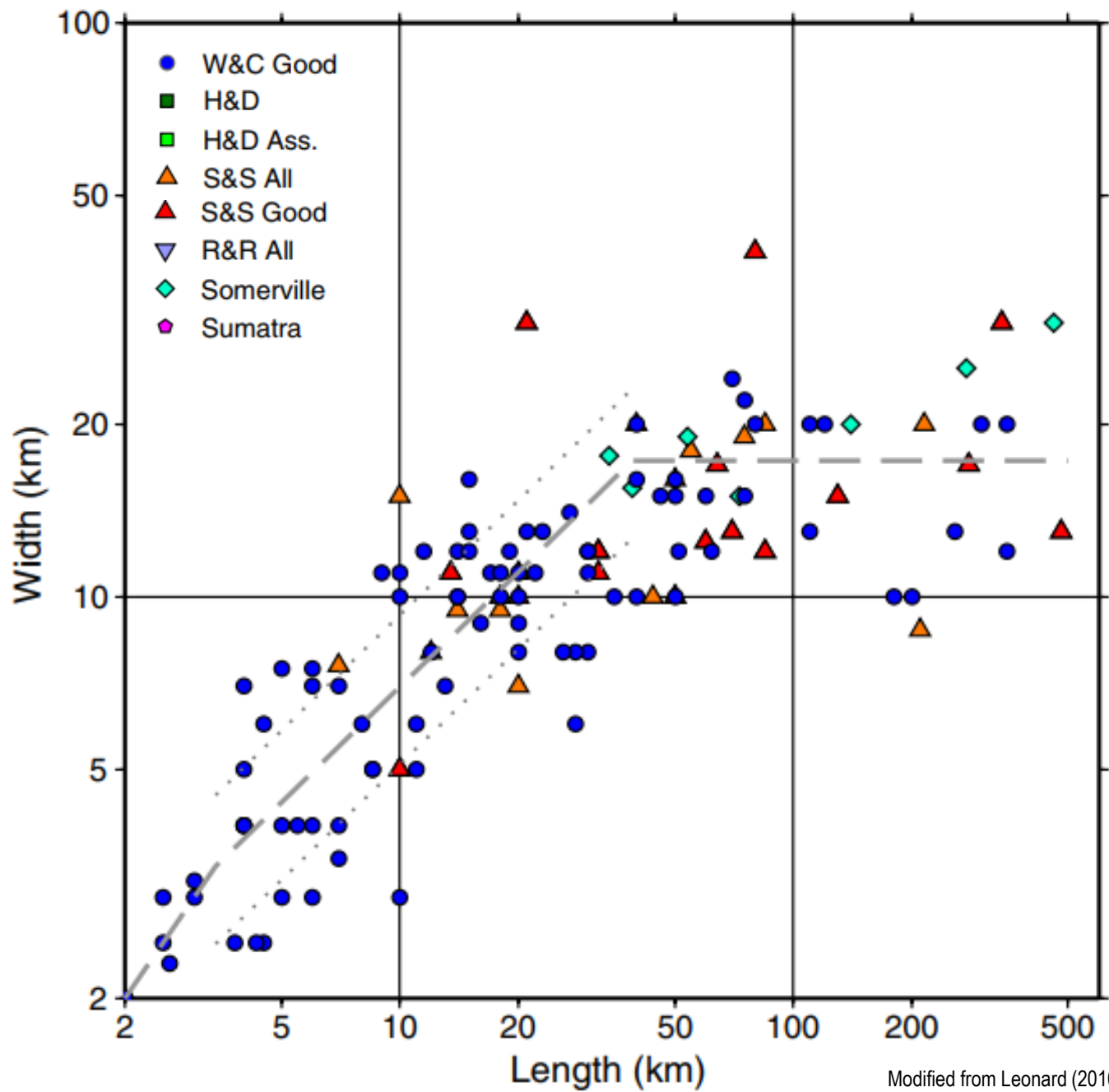
MODELED



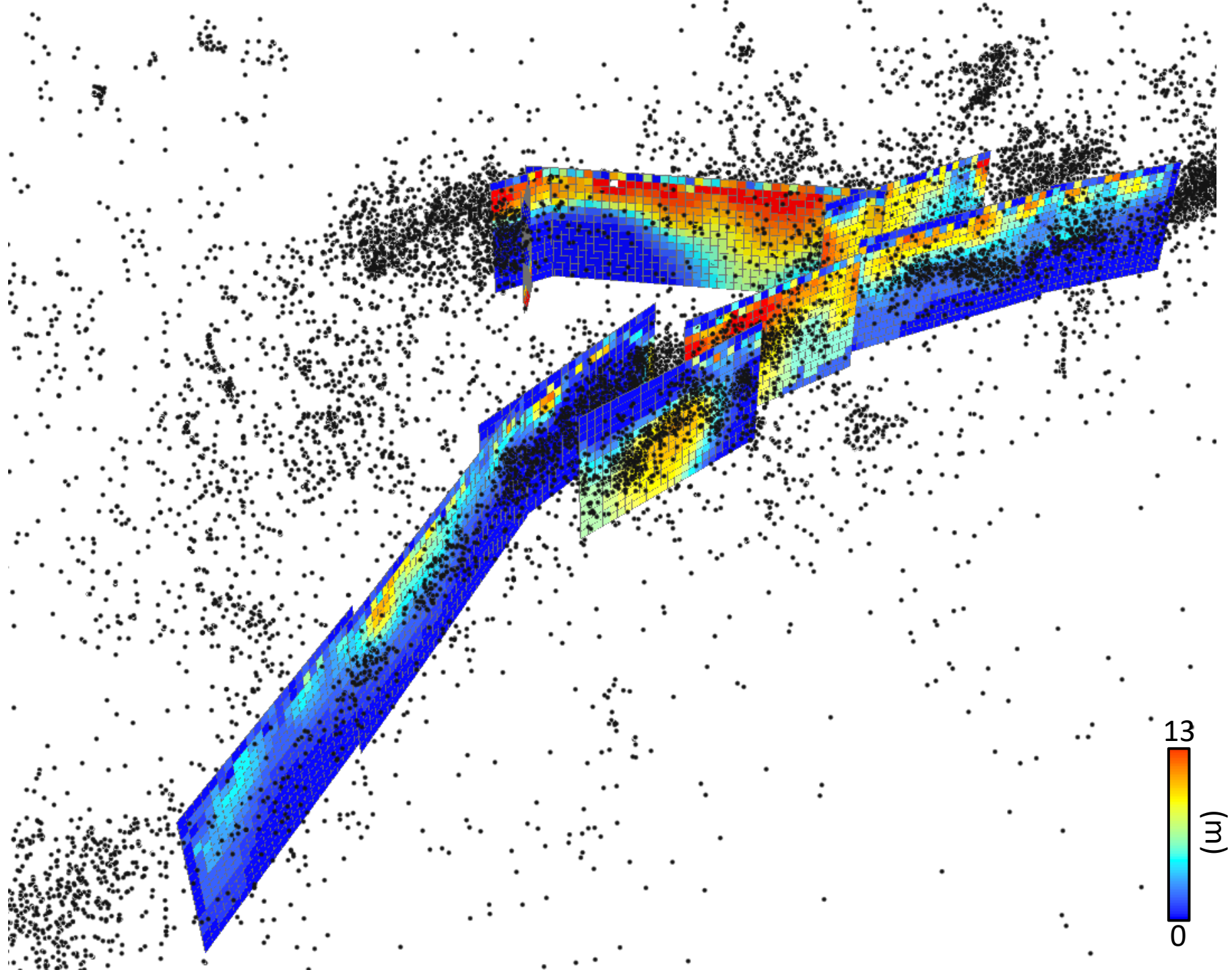
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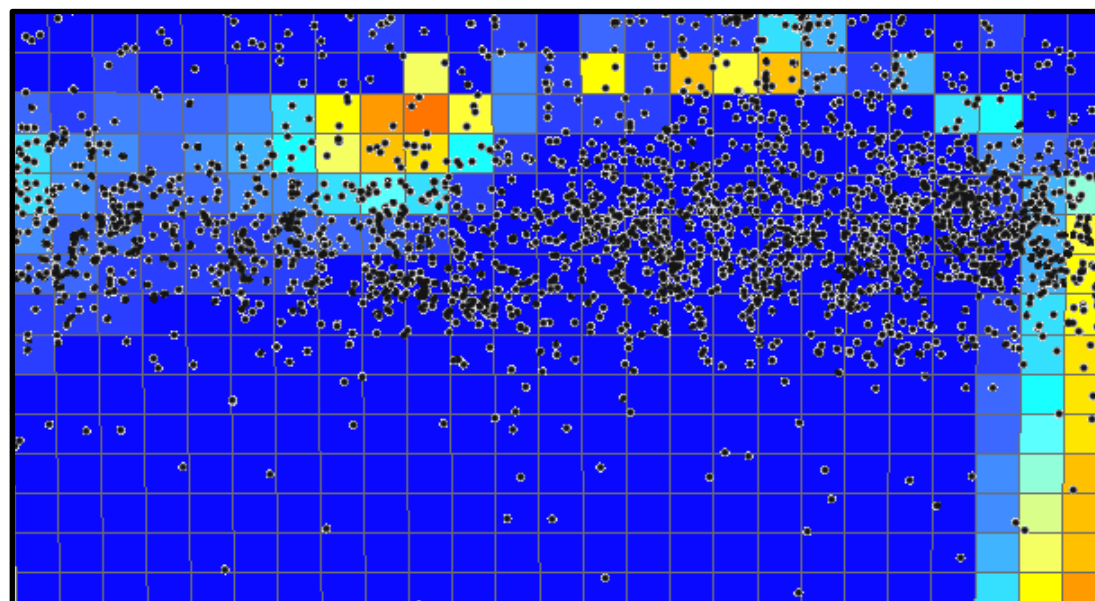
MODELED

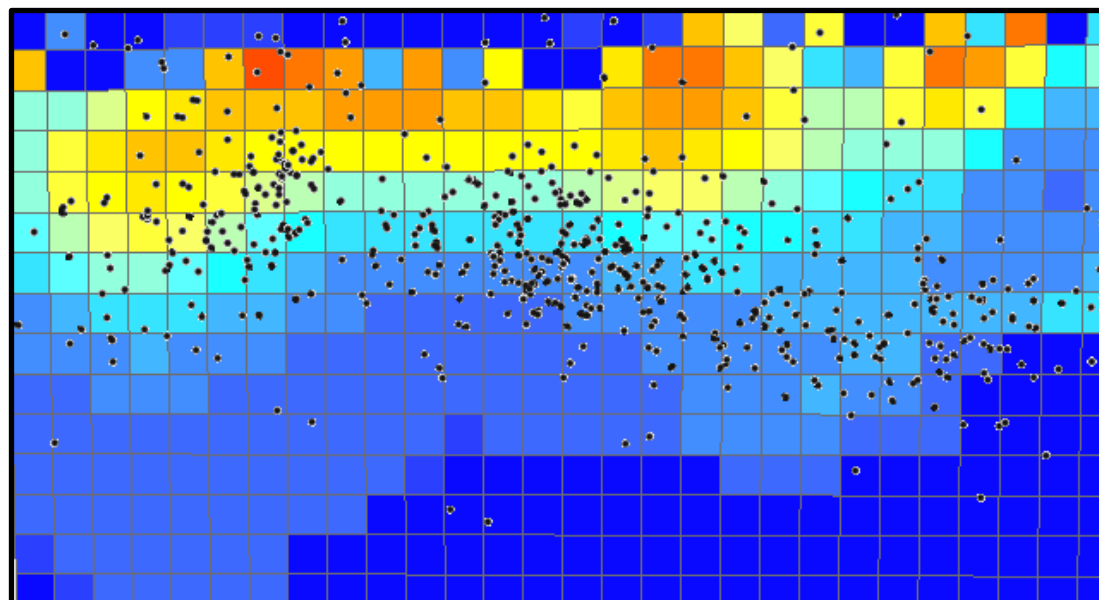




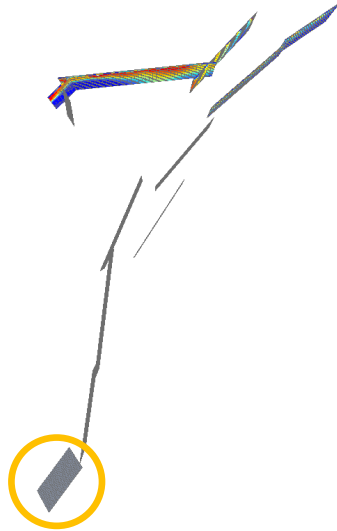
Modified from Leonard (2010)



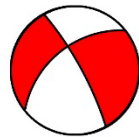
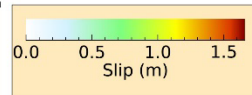
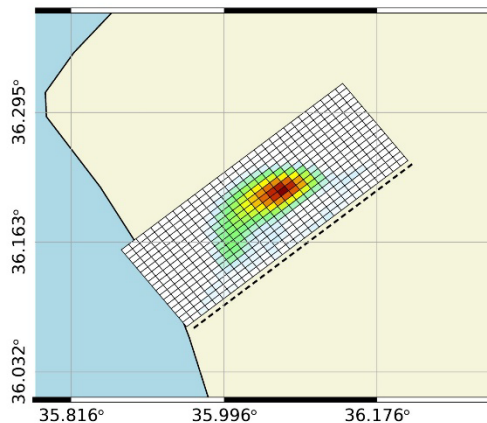




20 February 2023, Mw 6.4



M 6.3 Turkey [Sea]
(20/2/2023, 17:04 UTC)
Slip distribution from geodetic data



Moment: $3.09 \cdot 10^{18}$ N·m
Magnitude: 6.3
Depth: -7.0 km



Revised result (22-Feb-2023 15:42)



ISTITUTO NAZIONALE DI GEOFISICA E VULCANOLOGIA

Earthquake list

Seismic networks

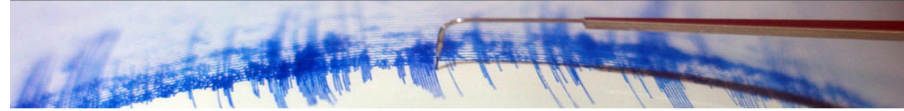
Real time data

Observatories and Centers

INGVterremoti

Site Guide

Contact



Finite Source

Earthquakes	Expected surface displacement scenario	Geodetic sources
2023-03-09 19:08:06 - Mw 4.5 6 km E Umbertide (PG)	INGV	FP1 - FP2
2023-02-23 00:37:42 - Mwp 6.7 Tajikistan	GCMT - USGS	FP1
2023-02-20 17:04:32 - Mwp 6.3 Turkey [Sea]	GCMT	FP1
2023-02-06 10:24:52 - Mwpd 7.5 Turkey	GCMT - USGS - USGS_FINITE_FAULT	
2023-02-06 01:17:36 - Mwpd 7.9 Turkey	GCMT - USGS - USGS_FINITE_FAULT	
2022-11-23 01:08:16 - Mwp 6.1 Turkey	GCMT - USGS	FP2
2022-09-19 18:05:15 - Mwpd 7.5 Michoacan, Mexico [Land: Mexico]	GCMT - USGS - USGS_FINITE_FAULT	FP1
2022-07-27 00:43:26 - Mwp 7.0 Philippines [Land]	USGS	FP1
2022-07-01 21:32:07 - Mwp 6.2 Southern Iran [Land: Iran]	GCMT - USGS	FP2



<http://terremoti.ingv.it/finitesource>

Thank you