



Joint GNSS-InSAR analysis of ground deformation on the eastern flank of Mount Etna.

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Goal

Provide detailed info to the behavior and kinematics of faults on eastern flank of Mt. Etna

- GEODynamic & GEOMatic Lab creates a GNSS network (**UNICT Network**) along the faults (sGPS)
- INGV network (**ETN@NET**) on the the eastern flank (sGPS and cGPS)

New data for the
development of
volcano-tectonic models
of the Etna volcanic
complex

Open up
new perspectives for
in-depth study of areas



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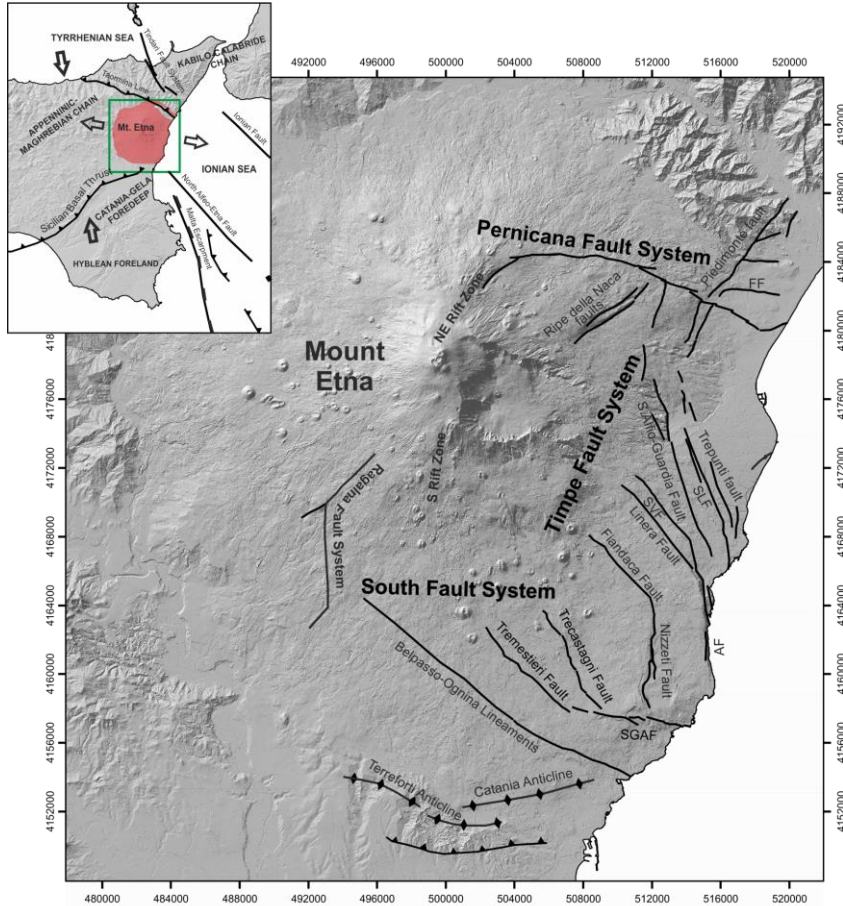


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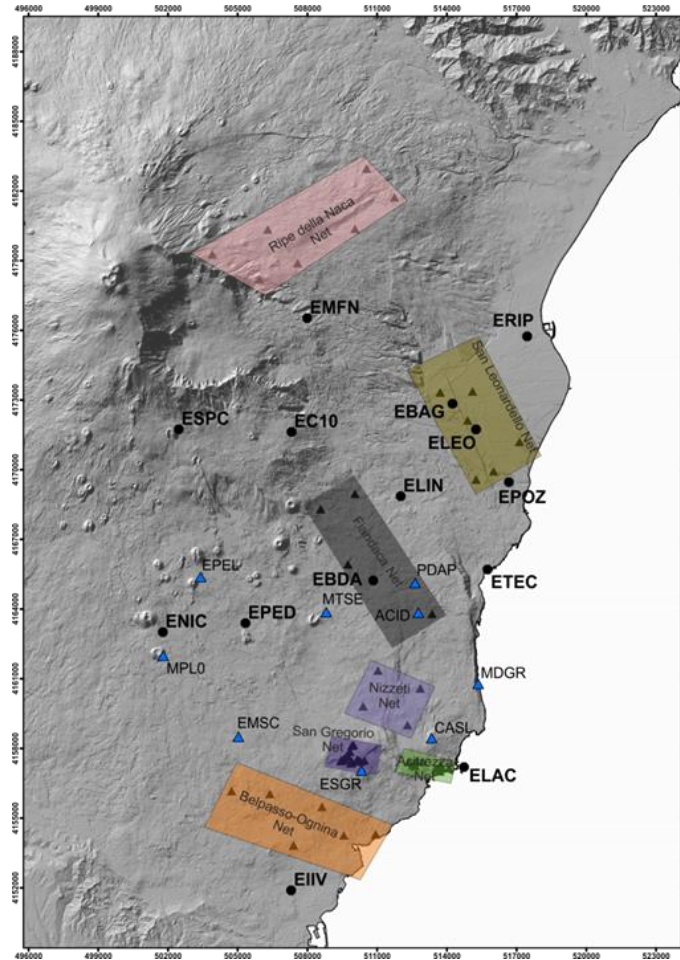


Main volcano tectonic elements of Mount Etna (Italy)



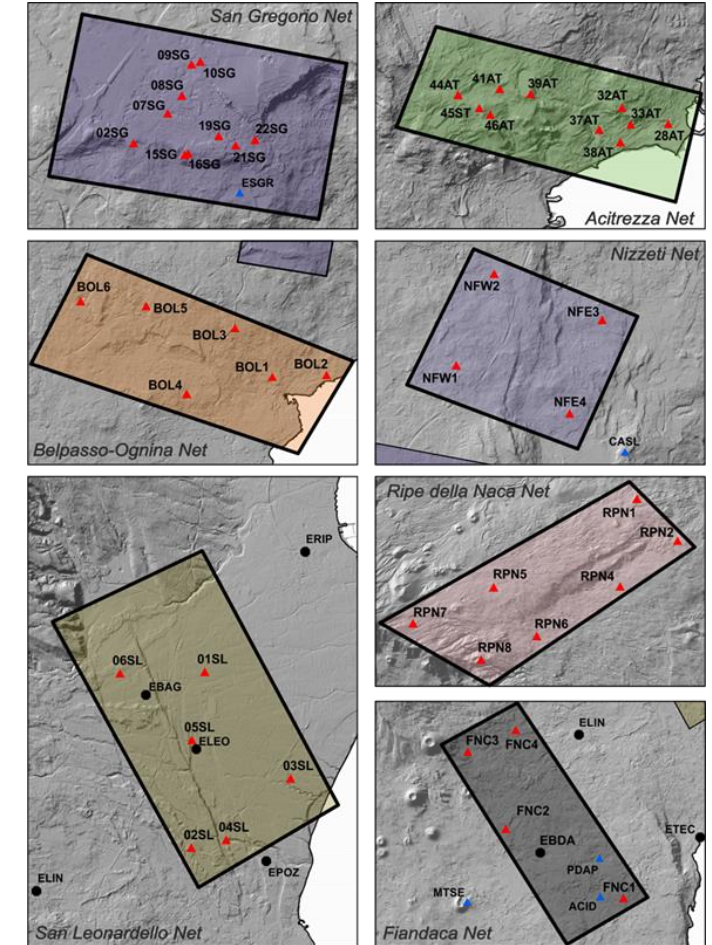
Three Fault Systems

GNSS networks on the eastern flank of Mt. Etna



- cGPS of ETN@Net
- ▲ sGPS of ETN@Net
- UNICT-Net sub networks

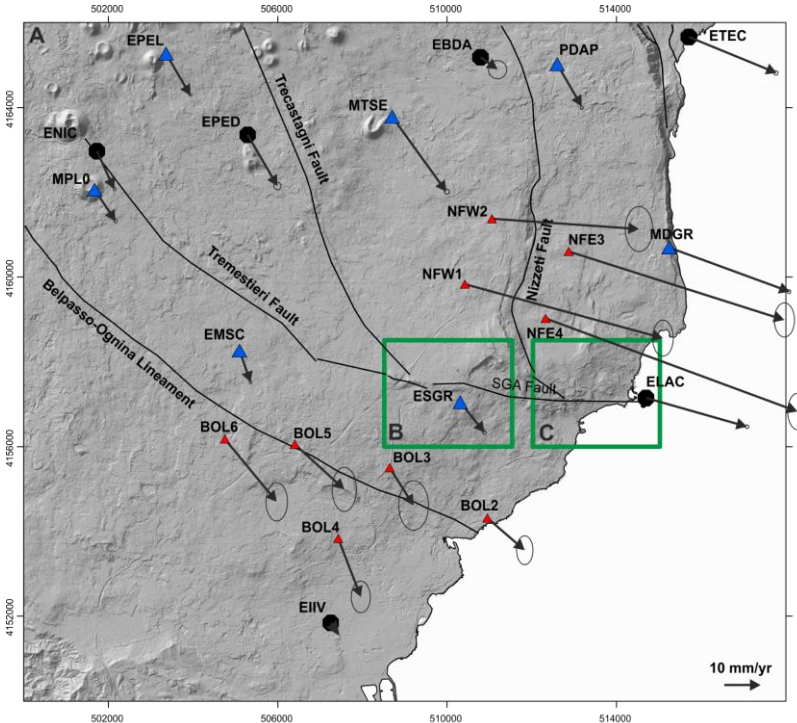
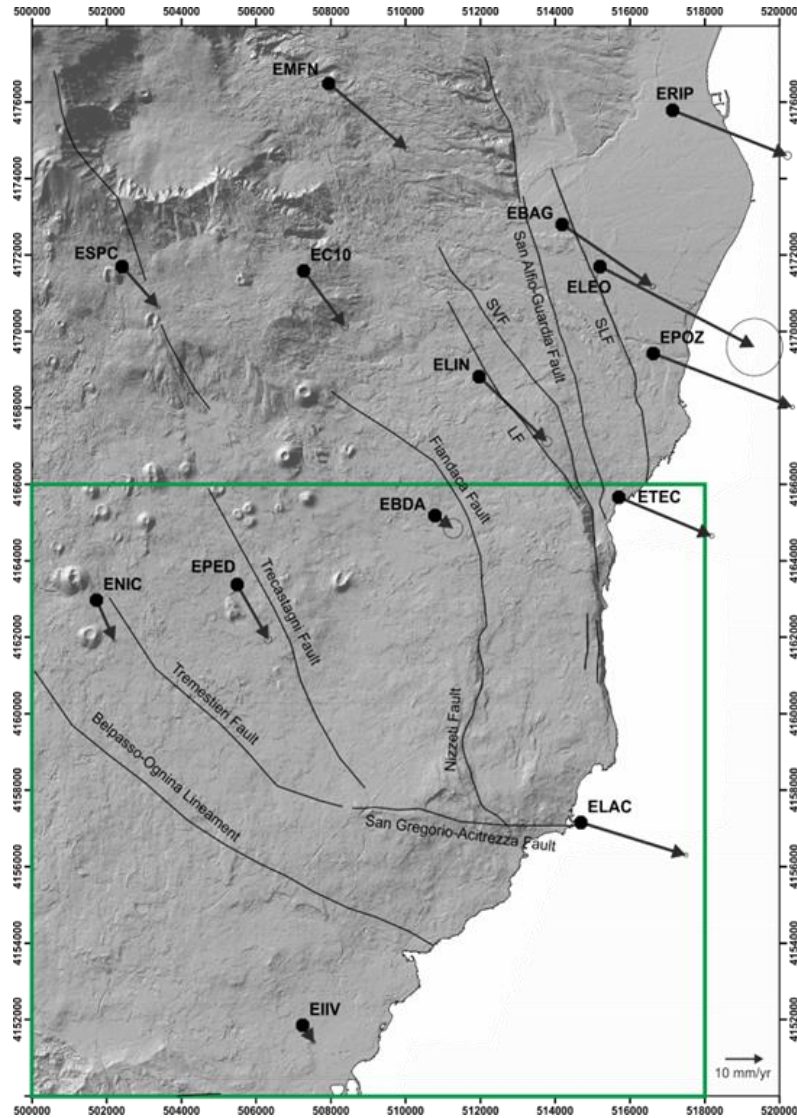
UNICT-Net



- ▲ sGPS of UNICT-Net



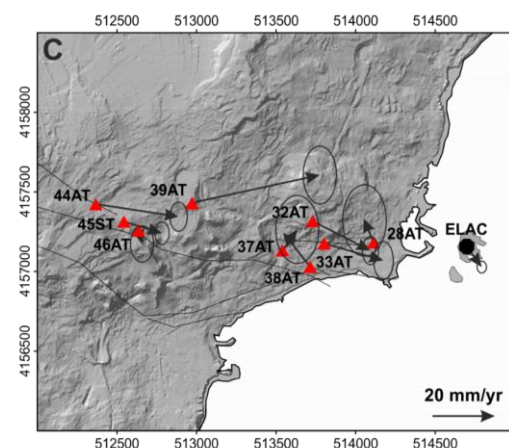
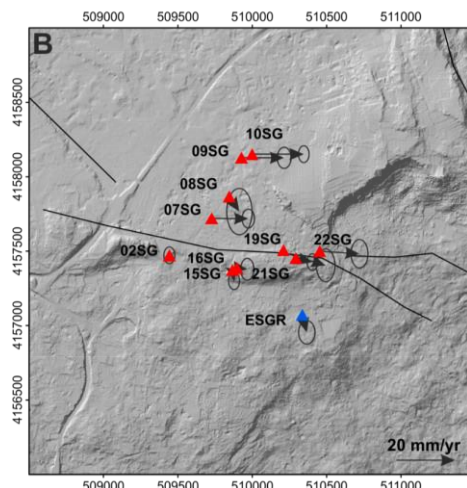
Velocity Field



Two local Reference Frames:

- South eastern Sicily
- Respect to 02SG

- ▲ sGPS of UNICT-Net
- cGPS of ETN@Net
- ▲ sGPS of ETN@Net



GipsyX 1.3
(default configuration)
(Bertinger et al., 2020)



InSAR Analysis

P-SBAS Sentinel-1 Processing on demand
(Casu et al., 2014; De Luca et al., 2015; Manunta et al., 2019)

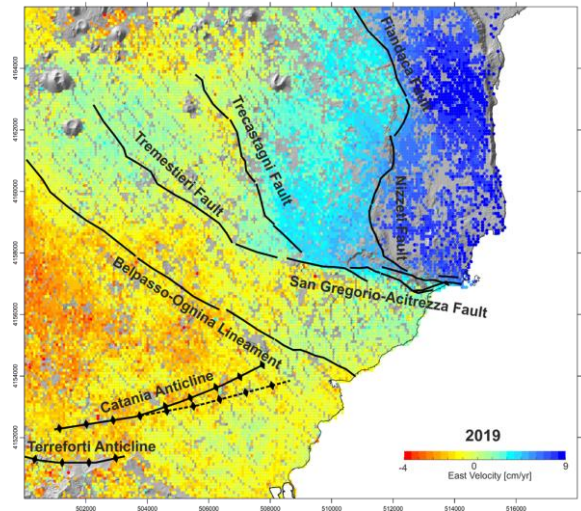
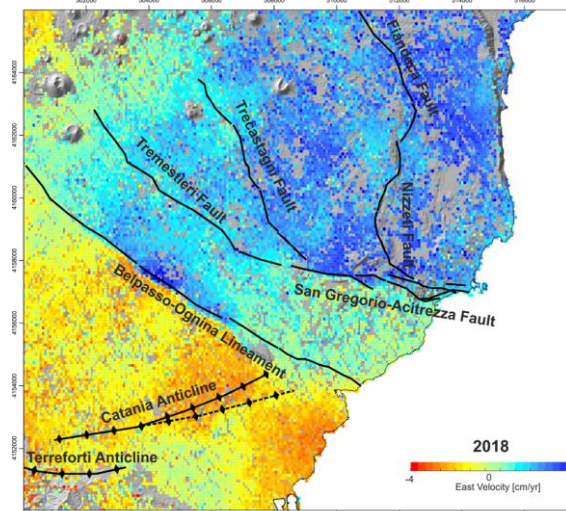
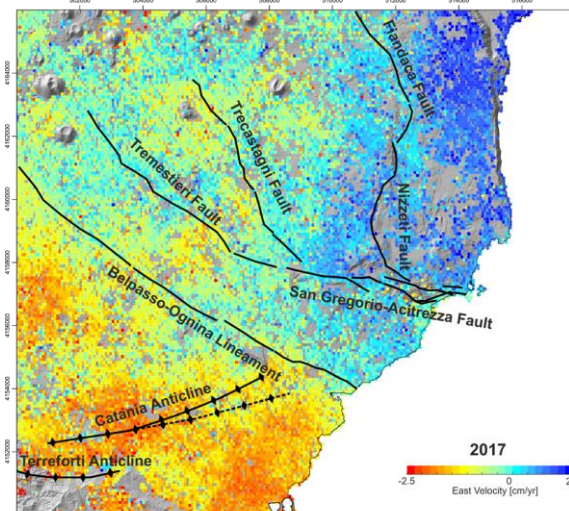
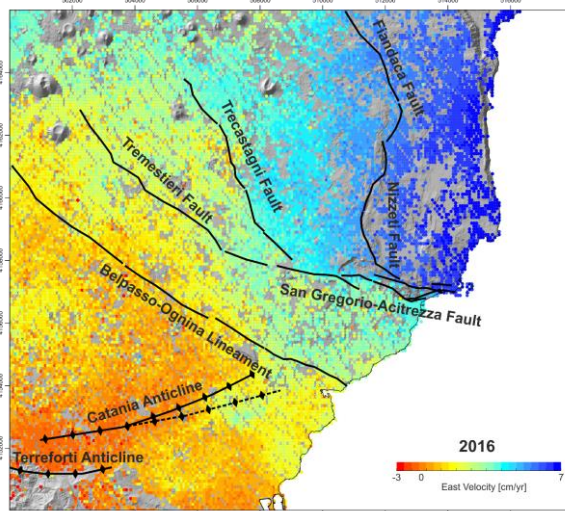
2016

2017

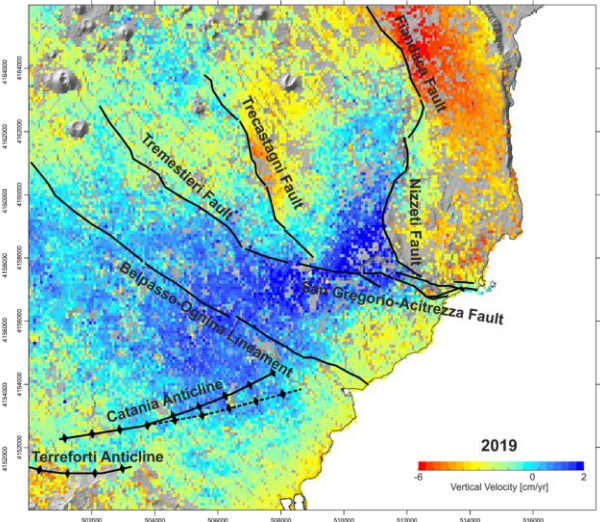
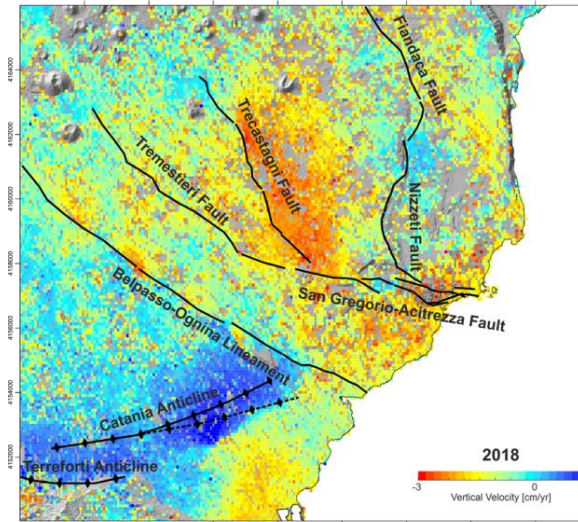
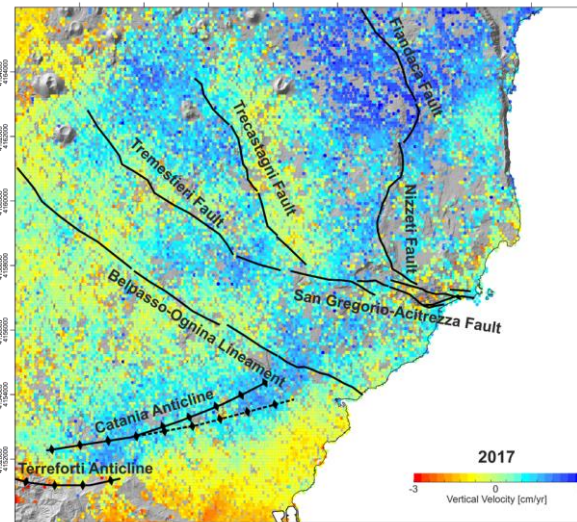
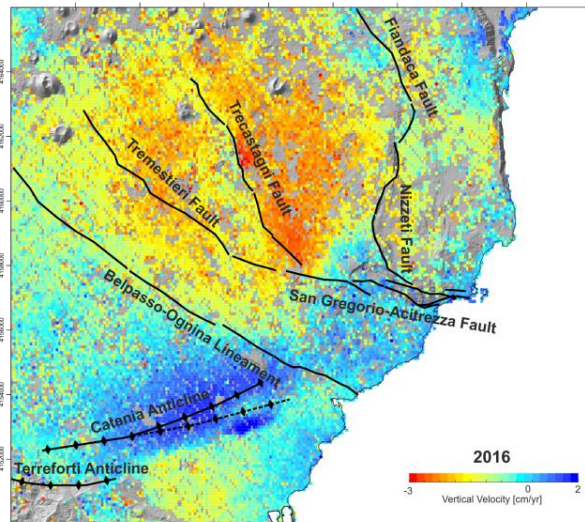
2018

2019

East Velocity

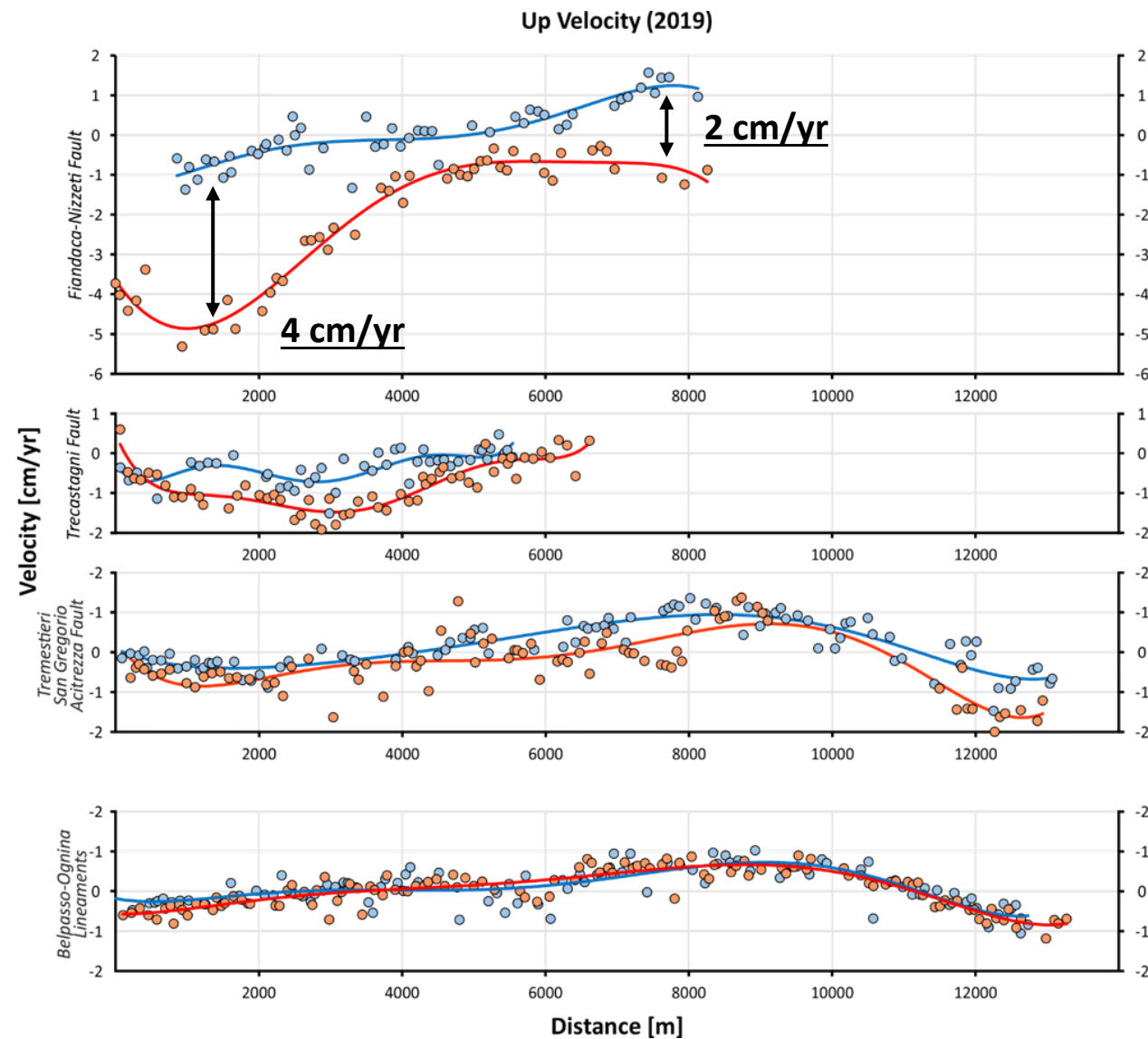
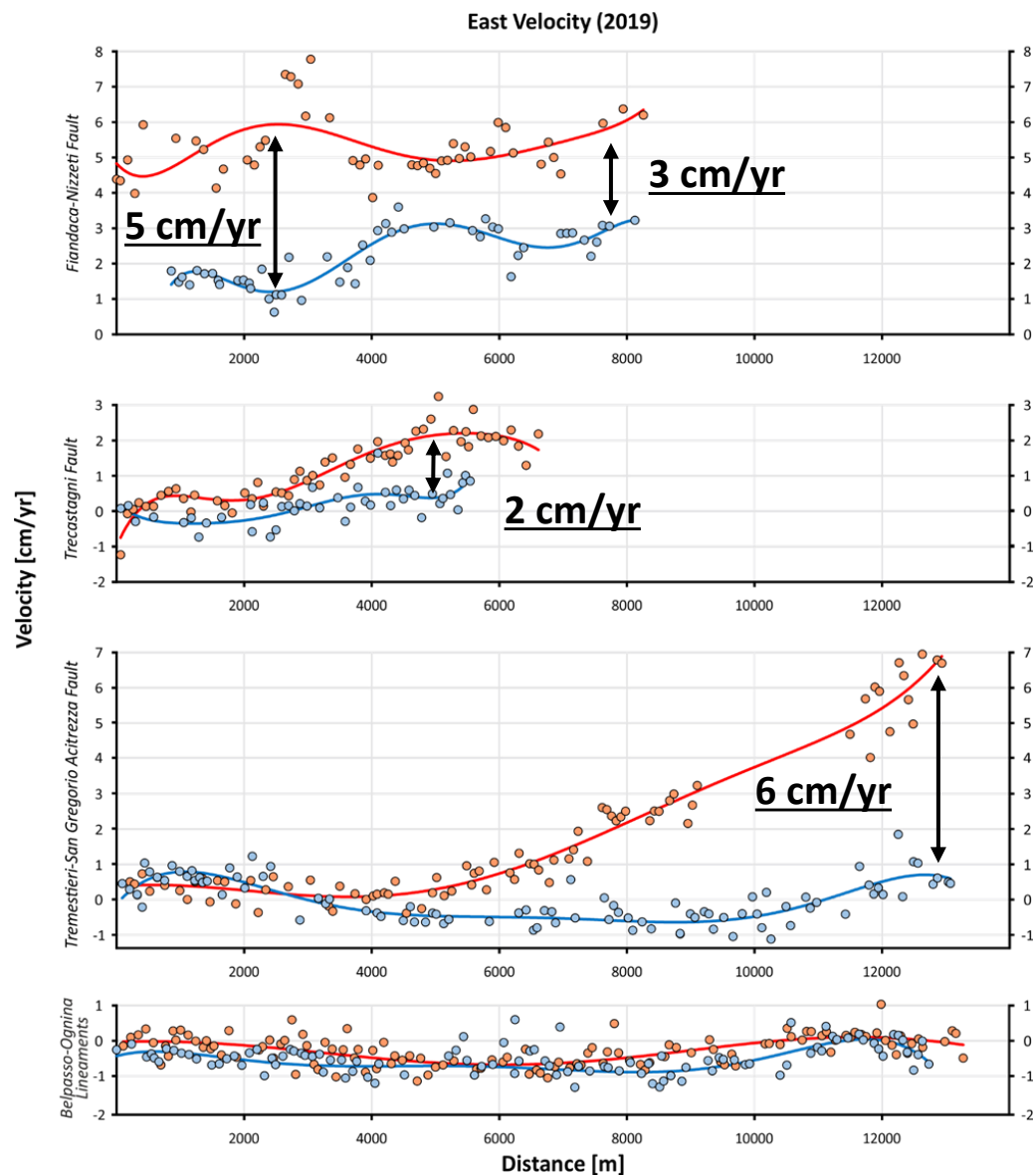


Vertical Velocity



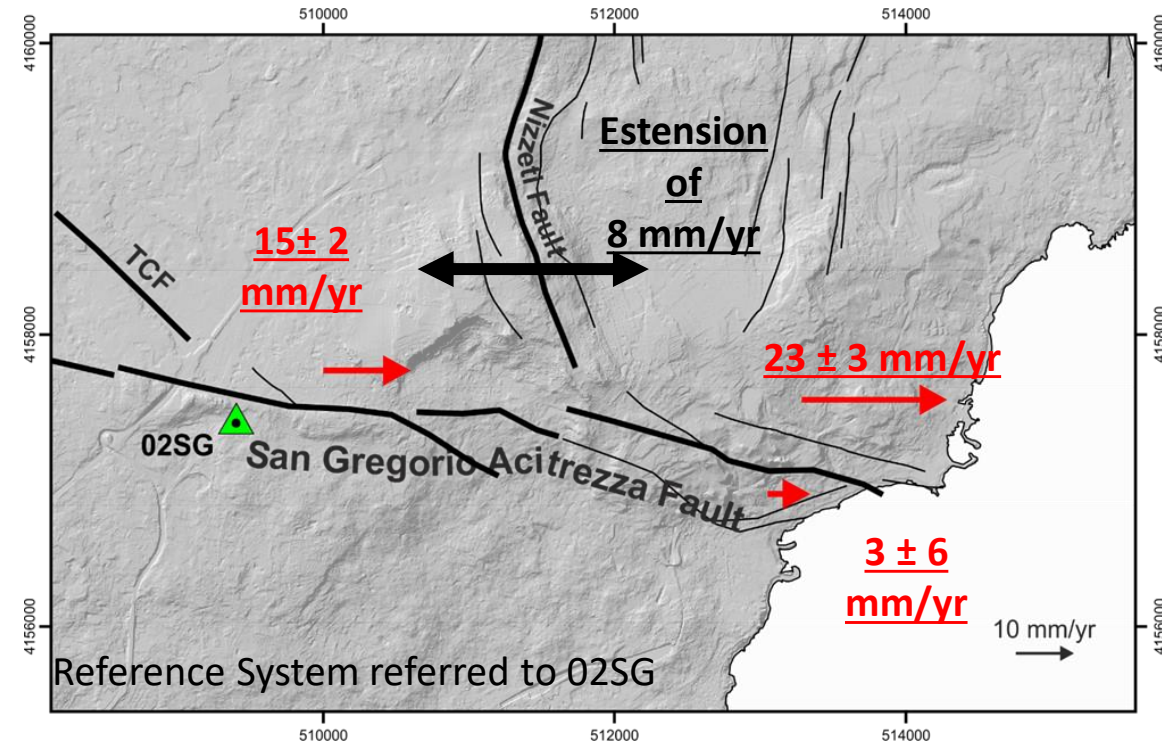


Fault Off Set





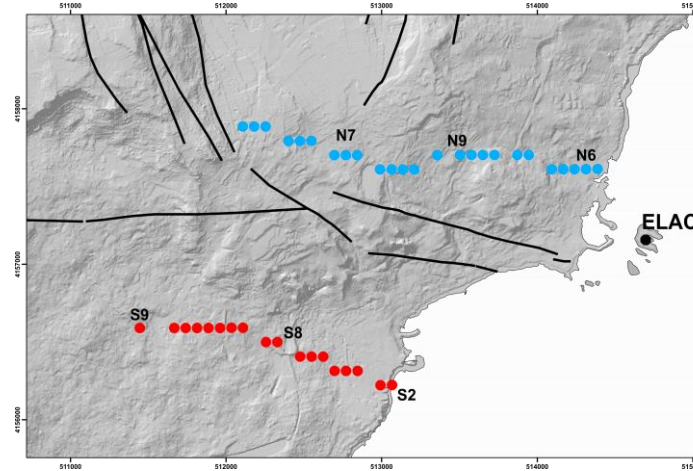
San Gregorio-Acitrezza Networks



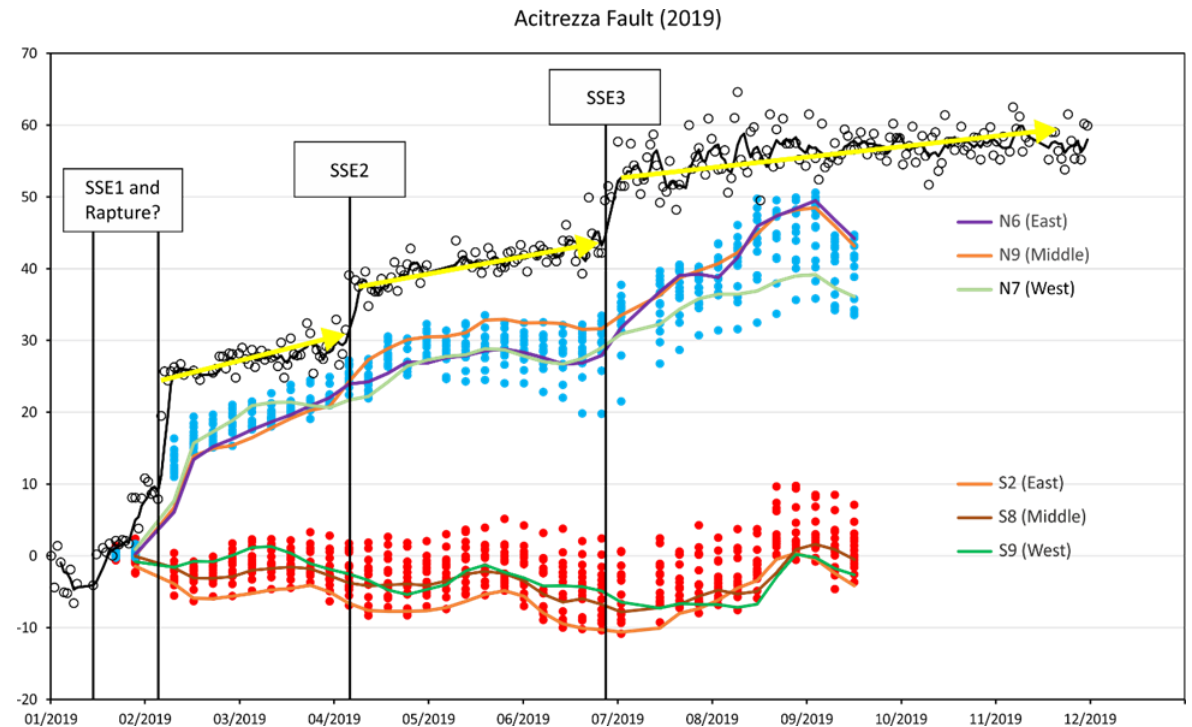
What is the role of the Nizzeti Fault??



Need improve of the monitoring system by the implementation of new GPS permanent stations



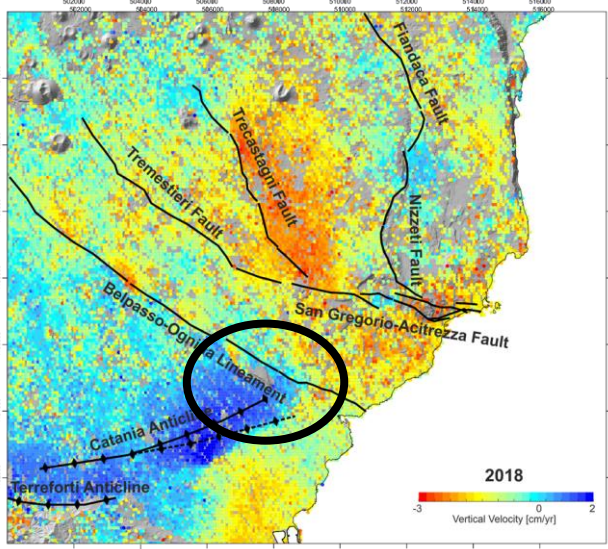
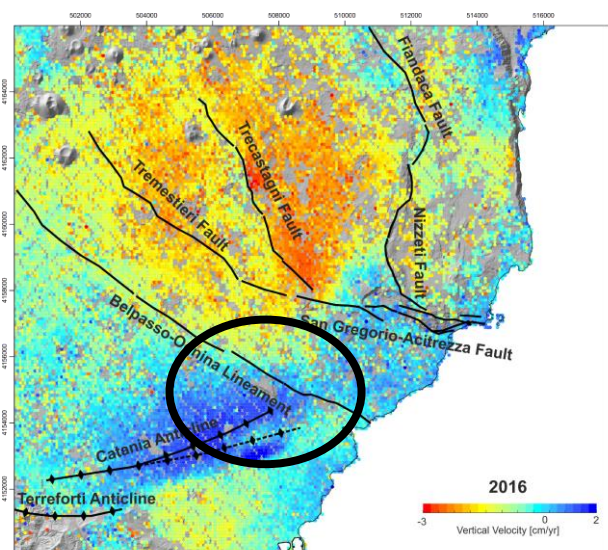
Slow Sleep Events on 2019 recorded by the ELAC station



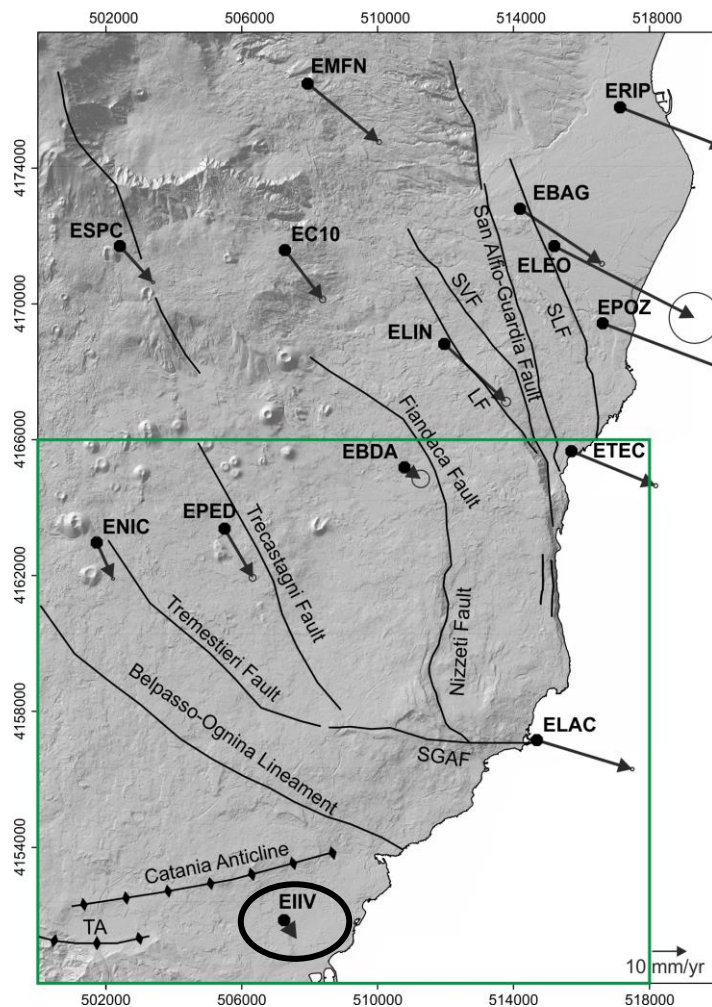


Belpasso-Ognina Lineament

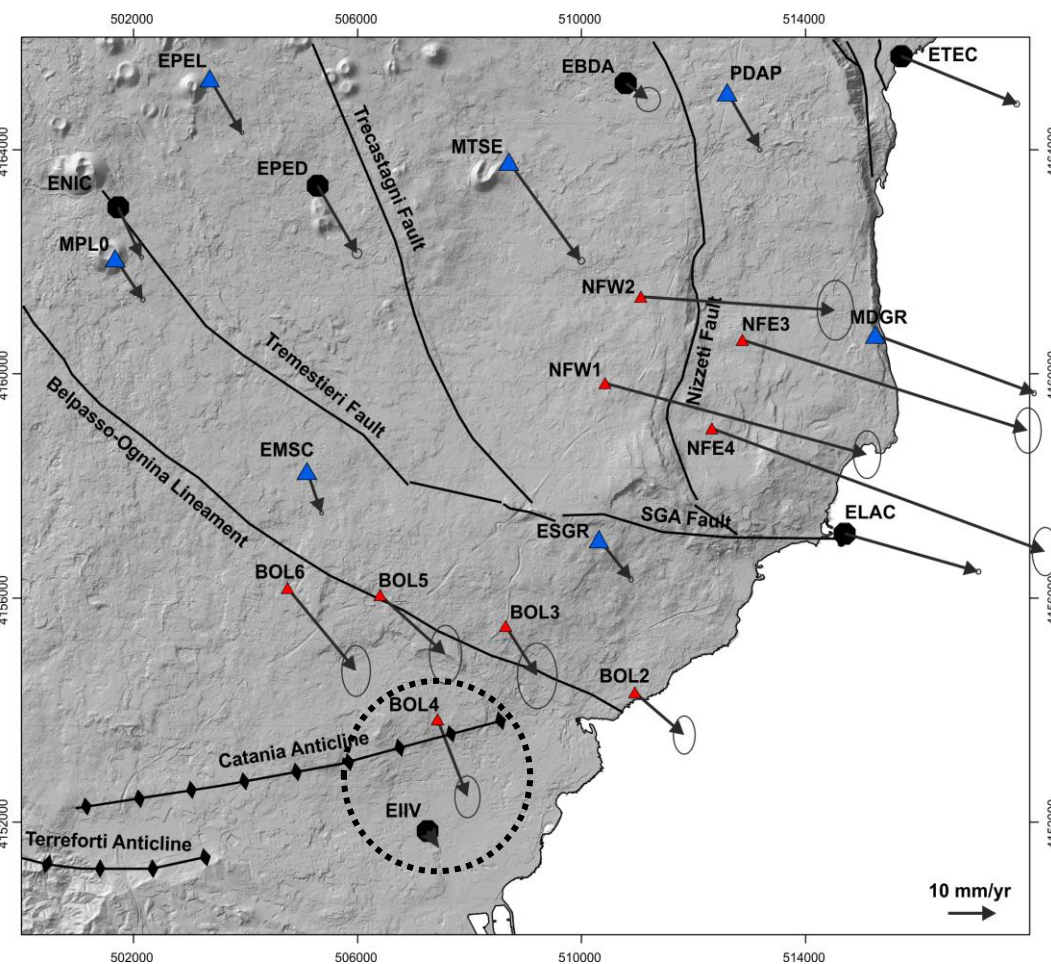
Interaction with the plicative structures on north-west of Catania



Flank dynamic disappears completely to the south



San Gregorio-Acitrezza fault accomdates most of deformations of the unstable eastern flank





Thank for your Attention!

