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Title: The reactivation of the Fiandaca and Nizzeti tectonic lineaments and the seismic crisis of 26 December 2018 (Monte Etna, Sicily)

The correlation between the reactivation of the Fiandaca and Nizzeti tectonic lineaments and the seismic crisis of 26 December 2018 (Monte Etna, Sicily)

We present the analysis of deformation carried by the geodetic monitoring of the tectonic lineaments along the eastern flank of MT Etna, affected by 2018 volcanic unrest. According to Bonforte et al., (2019) and Novellis et al., (2019) the intrusion of the hydrofracture responsible of the 24<sup>th</sup> and 25<sup>th</sup> December 2018 eruptive event, reactivated primarily the Fiandaca fault causing 26<sup>th</sup> December 2018 seismic crisis. The Fiandaca tectonic lineament extends for about 5 km in length between the villages of Fleri and Acicatena, is oriented NNW-SSE (Fig.1). It is characterized by low morphological evidence and by a predominantly normal kinematics with a subordinate right lateral component. The Nizzeti fault is part of the Acicatena-Valverde structural system, it shows from the south to the north, a NNW-SSE - NNE-SSW trending and a normal kinematic with a slight right transpressive component. The uprising feeder dyke generated an E-W oriented remote stress field producing a deformation on the eastern and the western flank of Etna volcano. In particular the stress trajectory determines a stress concentration along the main shear discontinuity given rise an earthquake of  $M_w=4.9$  and  $M_L=4.8$  (Monaco et al., 2020). The deformation on this area was analysed by a GNSS network composed by several benchmarks located after an accurate geological and geo-structural survey along the Nizzeti and Fiandaca lineaments. The monitoring campaign started on December 2018 and it is still going on. GPS data allowed us to reconstruct the velocity field of the studied area (Fig. 1), The inversion of geodetic data has been carried out through GAME tools (Cannavò, 2019) to determine the fault segments source model of the 26<sup>th</sup> December 2018 seismic event. A source model, congruent with the geological, geometric and seismic characteristics of the analysed tectonic structures, has been defined through the implementation of Okada sources and the use of different GPS data inversion algorithms (Fig. 2), in agreement with previous studies (De Guidi et al., 2018; Monaco et al., 2020).

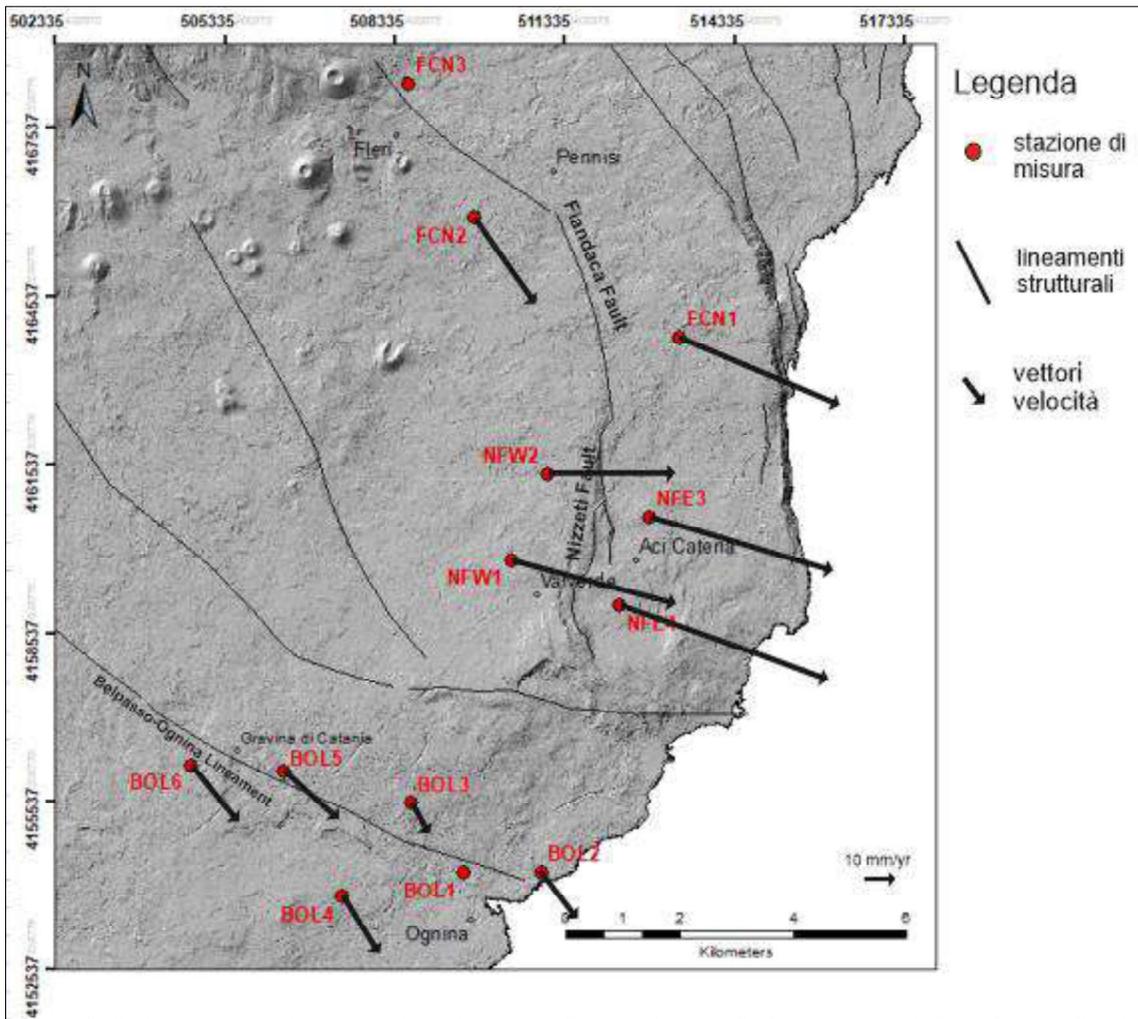
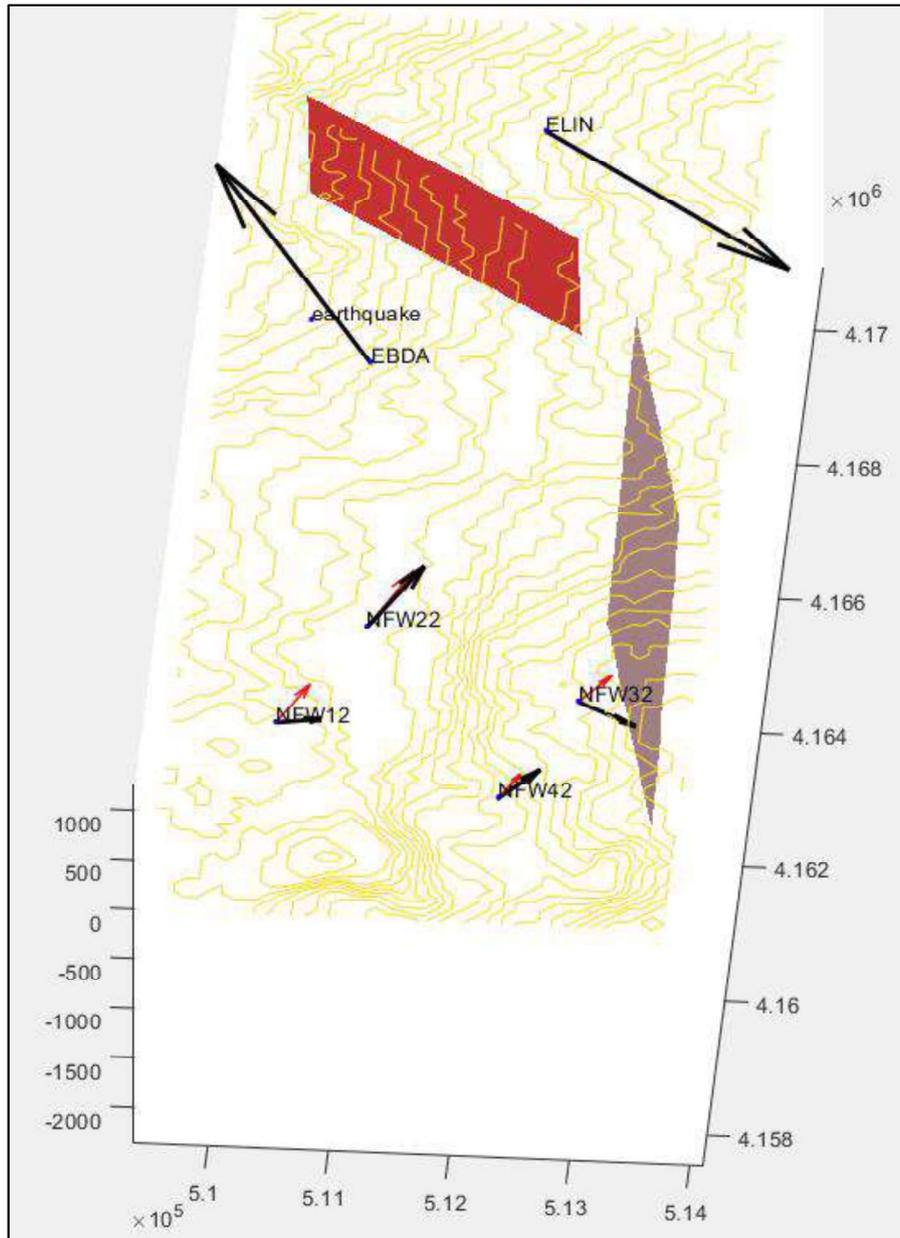


Fig. 1: Velocity field of south eastern flank of Mt. Etna.



*Fig. 1: source model for Fiandaca and Nizzeti Faults, obtained through GAME software modelling.*

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