



## **Stress interaction between magmatic intrusions and tectonic processes during the 2001-2003 eruptive period at Etna volcano (Italy)**

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The complex interaction between magmatic intrusions and tectonic processes responsible for the kinematics of the seismogenic structures at Etna volcano was investigated in term of stress transfer. In particular, we analyzed the seismic pattern during the period spanning the most recent eruptive flank activity, the 2001 and 2002-2003 eruptions. Thanks to the good stations coverage and the new tomographic images, which allow for a better resolution of the shallow layers (depth < 7 km), more precise hypocentral locations and details on the structural setting can be obtained. The 3D hypocentral locations and relative fault plane solutions were re-calculated for the two eruptive periods including the intra - eruptive period between 2001 and 2002-2003, by using three new more detailed velocity models. These seismic studies have highlighted the heterogeneous rheology and geometric complexity of the seismogenic zones at Etna volcano. Therefore we have attempted to account for these issues in a more realistic way using the finite element method (FEM). Indeed the numerical method allows for including both the velocity models in term of medium elastic heterogeneities and the real topography of Mt Etna. Results show that areas of positive Coulomb stress changes caused by the intrusive events well match the observed seismic pattern.