



Inflation leading to a Slow Slip Event and volcanic unrest at Mt. Etna in 2016: insights from CGPS data

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Global Positioning System (CGPS) data from Mt. Etna between May 2015 and September 2016 show intense inflation and a concurrent Slow Slip Event (SSE) from 11 December 2015 to 17 May 2016. In May 2016, an eruptive phase started from the summit craters, temporarily stopping the ongoing inflation. The CGPS data presented here give us the opportunity to determine 1) the source of the inflating body; 2) the strain rate parameters highlighting shear strain rate accumulating along NE Rift and S Rift; 3) the magnitude of the SSE; and 4) possible interaction between modelled sources and other flank structures through stress calculations.

By analytical inversion, we find an inflating source 5.5 km under the summit (4.4 km b.s.l) and flank slip in a fragmented shallow structure accommodating displacements equivalent to a magnitude Mw 6.1 earthquake. These large displacements reflect a complex mechanism of rotations indicated by the inversion of CGPS data for strain rate parameters. At the scale of the volcano, these processes can be considered precursors of seismic activity in the eastern flank of the volcano, but concentrated mainly on the northern boundary of the mobile eastern flank along the Pernicana Fault and in the area of the Timpe Fault System.