



## **Tilt measurements at Vulcano Island, Italy.**

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Since the last eruption in 1888-90 the volcanic activity of Vulcano Island (Aeolian Archipelago, Italy) is restricted to fumarolic degassing, concentrated near the active cone of “La Fossa” crater in the northern sector of the island. A network of tiltmeters is operating on Vulcano Island from numerous years. Tilt represents a fundamental contribution to understanding of volcanic phenomena and may play an important role in detecting possible eruption sources. Starting from 2004, the network comprises five functioning boreholes stations equipped with bi-axial instruments four of which installed at 8-10 m that allow to record very stable, high precision signals with very low noise (from 0.1 to 0.5 microrad at the different stations). We have analyzed the system capability in detecting a possible magma migration; in order to image a magma uprising deformation pattern we take in consideration the results obtained by Zanon et al. (2003) that have evidenced spatially well-defined levels of magma accumulation beneath “La Fossa”, at 1.6 km depth and at about 3-5 km beneath Vulcanello. We evidence that Vulcano tilt network at is able to detect uprising of very small magma volumes (ca.  $0.1 \text{ m}^3 \cdot 10^6$ ) not detectable with other techniques. Moreover we report observations of the last 12 years of continuous recording that have evidenced impulsive variation linked to seismicity and long-term (several years) trends. We discuss the relationship between coseismic tilt changes (linked to strongest seismic events located in a radius of about 30 km from Vulcano) and site acceleration. Finally tilt long-term variations, analyzed together to discrete distance measurements, suggest that the “La Fossa” cone area is affected by deflation episodes.

### References

Zanon, V., M.-L. Frezzotti, and A. Peccerillo, Magmatic feeding system and crustal magma accumulation beneath Vulcano Island (Italy): Evidence from

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