

# Employment of tiltmeter arrays to investigate deformations related to recent volcanic and magmatic activity in the Eifel Volcanic Region

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Geodetic measurements have been employed to investigate surface deformations related to volcanic activities in many locations worldwide. As part of these endeavours, for now more than 100 years, tiltmeters have been successfully applied. As recent studies document that relatively small but significant, deep seismic signals can be detected in the East Eifel Volcanic Field, we suggest the employment of small tiltmeter arrays at selected points, embedded in multiparameter stations. It is envisioned to record quasi-continuous tilt data over the period of a few years to obtain adequate coverage in time in regard to define baselines, map the current situation, as well as to recognise and to interpret potential changes and to potentially detect long-term deformation. Based on the planned measurements with high resolutions of  $\mu\text{rad}$  to  $\text{nrad}$ , it is expected to observe the adjacent, slightly overlapping frequency range of surface deformation in reference to seismic signals. Tiltmeter investigations can therefore act as a link between seismic findings and further scientific endeavours, namely (a) studies operating on much longer wavelengths, e.g., gravity and gas monitoring, and (b) techniques covering larger spatial dimensions, e.g., GNSS and InSAR. The presentation will include new tilt data obtained in an underground laboratory backing the feasibility of the aforementioned concept, which can be part of a permanent monitoring programme in the volcanic fields of the Eifel.

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