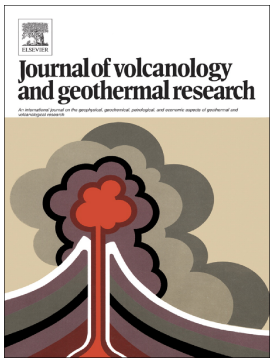

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Spatial and Temporal Patterns of Deformation at the Tendaho Geothermal Prospect, Ethiopia

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Abstract

Observations of ground deformation in East Africa have been fundamental for unveiling the tectonics of continental rifting, assessing the seismic and volcanic hazard to development, and identifying geothermal resources. Here we investigate the active natural and anthropogenic processes in the Tendaho Graben, Afar using Interferometric Synthetic Aperture Radar (InSAR) collected by the Envisat satellite in 2004-2010. We used the Poly-Interferometric Rate And time series Estimation (π-RATE) method to calculate displacement in satellite line-of-sight, and a least-square inversion to decompose the line-of-sight displacement into vertical and rift perpendicular components. We observe two zones of deformation: a 20 km wide circular region of subsidence located 10 km northeast of the town of Semera with a maximum displacement rate of $\sim$5 cm/yr; and elongated zone (50 km) of subsidence in the area of the geothermal prospect, maximum rate of $\sim$4 cm/yr. The

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