Poster Title: Volcanic unrest in Kenya: a satellite perspective

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Abstract:

The East African Rift (EAR) system is a 5,000 km long series of fault bounded depressions that run from the Red Sea to Mozambique. The use of InSAR throughout the East African Rift has led to the discovery that a number of volcanoes, which haven’t erupted in human history, are actively deforming. In Kenya, the EAR hosts 14 Quaternary volcanoes that lie along its central rift axis. An initial InSAR study, covering the period 1997-2008, discovered that four volcanoes underwent geodetic activity during this time.

We present results from a long-term ENVISAT and ALOS PALSAR monitoring campaign of Kenyan Rift volcanoes. Using multi-temporal interferograms, we construct time series of ground deformation. We discover that two Kenyan volcanoes, Silali and Longonot, are undergoing slow subsidence, at mm rates which single interferograms are unable to detect. We also discover that a third volcano, Paka, has undergone a second period of uplift between 2009-2010 at a rate of 1.6 cm/year.

Satellite-based observations play an important role in monitoring and assessing volcanic hazard in this remote region. There is a limited historical record of volcanic activity in Kenya and detailed eruptive records are understudied. We present a remote-sensing study to investigate the temporal and spatial development of volcanic activity at Longonot volcano. Through high-resolution mapping using ASTER, SPOT5 and GDEM imagery, we identify boundaries of eruptive units and begin to establish Longonot’s eruptive history. Understanding the source of the geodetic signal, which may be magmatic, hydrothermal or a combination of both, using both geological and geophysical techniques will aid interpretation of InSAR signals observed elsewhere in the East African Rift and guide future hazard studies across Kenya.