

Understanding Volcanic Inflation of Long Valley Caldera, California, from Differential Synthetic Aperture Radar Observations

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Abstract Form

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The results using interferometric synthetic aperture radar (SAR) to measure the co-seismic displacement from the June 28, 1992 Landers earthquake suggest that this technique may be applicable to other problems in crustal deformation. Since late 1989, Long Valley Caldera, California, has been in a state of unrest that has been characterized by the re-inflation of the resurgent dome. Several geodetic techniques that are being used to understand the magmatic activity indicate that deformation on the order of centimeters/year is occurring. Theoretically, these rates are large enough to be detected using differential interferometric SAR using data sets from NASA's IRS 1 & 2 satellites and from NASA's DC-8 AIRSAR to form the interferograms of the surface deformation. For the data collected by the aircraft, it is critical that the aircraft navigation be on the order of meters and that the flight path reconstruction be on the order of centimeters. This paper will discuss the technical aspects of applying this technique to understand these processes using existing and future satellite and aircraft SAR data sets.

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