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Deformation at Fogo volcano, Cape Verde, detected by persistent scatterer InSAR

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Fogo Island in the Cape Verde Archipelago (North Atlantic) is a stratovolcano of nearly conical shape that rises 2829 m above sea level and ∼6000 m above the surrounding seafloor. With a population of 40000, the island has known intense historical volcanic activity since AD 1500, with an average interval between eruptions on the order of 20 years. Twentieth-century rates were more subdued, with only two flank eruptions in1951 and 1995. Following the 1995 eruption, increased awareness of the volcanic hazard affecting the population of the island led to the deployment of the permanent VIGIL Network. Seismographic stations (both broad band and short-period), tiltmeters and a CO2 sensor where installed in Fogo, together with altimeter infrastructure to allow remote real-time monitoring.

We first use the persistent scatterer InSAR method (StaMPS) to analyze ENVISAT ASAR data, acquired from June 2005 to September 2007, to determine line-of-sight displacements. The signal we see is consistent with a response to periodic deformation, but could also be due to atmospheric effects.

We refine the results by the application of a combined multi-temporal InSAR approach that includes both persistent scatterer and small baseline methods. We improve the signal by further reducing the influence of the atmospheric effects and present comparative results.