Fine structure of the subsidence at Izu-Oshima volcano, Japan: insights from D-InSAR with very short baseline

Masato Furuya[1], Shuhei Okubo[2]

[1] ERI, [2] Earthquake Res. Inst. , Univ. Tokyo

Despite the ground tumescence at the Izu-Oshima volcano, Japan, since early 1990s detected by EDM (Electro-optic Distance Measurement) and GPS (Global Positioning System), recent D-InSAR (differential interferometric synthetic aperture radar) analyses showed a subsidence at the caldera region [Murakami et al. 1999; Okuyama et al. 2002]. Murakami et al. (2000) interpreted it as a caldera subsidence; the inflation source beneath the volcano allows the caldera region to subside, by unlocking a prescribed creeping normal fault interface between the caldera itself and the region outside the rim. We also examined the ground displacement, using ERS1/2 (European Remote Sensing Satellite) data with very short baseline, so that we are free from errors in digital elevation map. Though a coherence is lost over the most part of the volcano because of the vegetation, the lava flow area turned out to keep coherence over the period of more than two years. As a result, we found that the shape of subsidence area and the rate are closely correlated with the lava flow area and the lava thickness, respectively. This observation cannot totally reject the caldera subsidence hypothesis. To say the least, however, we can suggest that, in order to argue a secular caldera subsidence, we need to correct for the effect of lava flow contraction and/or lave flow subsidence even after a decade of the latest lava emplacement.