



Potentials of L-band ALOS interferometry for the measurement of ground deformations at Etna volcano

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Using eleven ascending PALSAR scenes acquired by the Japanese satellite ALOS over Etna, between January 2007 and September 2008, we produced a series of interferograms covering the volcano and surroundings, by using ROI-PAC software. We compare our results with ENVISAT interferograms covering the same period. The coherence is significantly higher than C-band and it is particularly high in the inhabited areas and on lava flows emplaced during last centuries, where local subsidence is observed on the most recent ones; important improvements in the coherency are also achieved on forested areas. L-band interferometric pairs having large baselines, up to 3 km, are still usable but the coherency significantly fall off, as the baseline increases. Deformation patterns are well measured, and the use of L-band dataset is particular useful in those cases where the coherency in C-band is usually low. This is the case, for instance, of the north-eastern sector of the volcano, where the large forested area made difficult to measure the important ground deformations produced by the dynamic of the Pernicana Fault and the NE Rift zone. The known left lateral strike slip creep across the Pernicana fault is, indeed, well mapped. It can be quantified over the observation interval along the entire fault and compared with the GPS measurements. In the next years, we hope that the acquisition plan of ALOS will permit the capture of more PALSAR scene with the same sensor and orbit parameters. This will constitute a new and exceptional data base, crucial for the knowledge of the dynamics of Etna.