Ground deformation in Thessaly, central Greece, between 1992 and 2000 by means of ERS multi-temporal InSAR

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Abstract

We used SBAS (Small Baseline Subset) algorithm developed at IREA–CNR to detect the temporal displacement evolution over Thessaly (Greece) region, an area characterised by considerable neo–tectonic activity. 47 ERS descending images and 23 ascending, spanning from 1992 to 2000, were combined to produce about 150 interferograms, through which we retrieved the mean velocity field and the time series for the whole region. The SRTM digital elevation model was used to remove topography from the interferograms. The low frequency component of the velocity field of the independent ascending and descending datasets shows a relative uplift of the western part of the mountains compared with the eastern part; a considerable E–W horizontal component is also present. In the large Larissa plan, despite the lack of temporal coherence due to strong farming, a strong subsidence is observable over the Larissa urban area. Here the periodic component of the signal probably reflects the water table fluctuations connected with over–pumping for field irrigation.