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Application of DInSAR technique to areas of active ground deformations: the study case of the 26 December 2003 Iranian earthquake.

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We are establishing a processing chain of Synthetic Aperture Radar (SAR) data in order to obtain differential interferometric products in areas of active ground deformation (e.g. seismogenic areas, volcanic districts), for the identification and parametrisation of deformation sources. To test our procedure, we chose to study the ground deformations occurred in the epicentral area of the 26 December 2003 Bam earthquake (Iran). The availability of several previous studies allows to check the reliability of our results. Processing was performed on ENVISAT ASAR data collected in the "Bam earthquake: Envisat ASAR dataset" freely distributed by the European Space Agency (ESA). A preliminary processing was done using I.D.I.O.T., a software package for fully automatic generation of differential interferograms from ENVISAT Single Look Complex (SLC) SAR data (Reigber et al., 2007). Topography was subtracted using SRTM-3 ver.2 patches. After detecting the presence of ground deformations by the prelimary processing, an advanced processing was performed using Doris, a single program that can perform most common steps of the interferometric radar processing starting from SLC data (Kampes and Usai, 1999). In this case USGS gtopo30 DEM's and SRTM patches are used to subtract topo-phase. DInSAR processing of both ascending and descending passes shows that a clear deformation fringe pattern was recognisable in the study area. This deformation can be related to coseismic effects. A model of the strain source was obtained from the inversion of deformation

data. The technique consists in a non-linear inversion of surface deformation using the model of Okada (1985). The approach is applied on progressively finer spatial scales in order to obtain an image of the complex fault system. A new preliminary propose of the seismogenic source is presented here.

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