Geophysical Research Abstracts
Vol. 12, EGU2010-12989, 2010
EGU General Assembly 2010


# Inversion of dislocation models from DInSAR wrapped interferograms

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The Differential Interferometric Synthetic Aperture Radar (DInSAR) technique has been widely used in the interpretation of the phenomena associated with the recent earthquakes.
DInSAR is able to provide unique information, i.e., accurate and dense surface displacement maps with the only limitation of the scene revisiting time.
Integration of geophysical models is commonly carried out at the DInSAR post-processing stage and, by knowing the fault geometry, the inversion problem is linear. In this work we deal with the problem to integrate geophysical models within the DInSAR processing chain: more specifically we consider the possibility to exploit co-seismic models directly at the interferogram level. Although the inversion problem from the measurements (the wrapped interferogram) to the unknowns (the fault slip distribution) becomes non linear, the use of models at the interferogram level may help critical processing steps such as the phase unwrapping. Phase unwrapping, which is needed to retrieve the absolute phase information (the signal which is linearly related to the line of sight displacement component) starting from the measured interferometric phase signal may be critical in the presence of large deformations and loss of the interferometric signal coherence associated with vegetation and changes of the scene response.
We present the results of a model inversion carried on interferograms generated from real ERS data and relevant to the Mw 5.9, September 1999 Athens earthquake.