



InSAR application for geodynamic study of the 14 August 2003 Lefkada, Greece earthquake

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The area of the Central Ionian Islands, one of which is the Lefkada Island, is the transition zone between the West Hellenic arc and the Apulian plate and it is recognized as Kephalaria Fault Zone (KFZ) with strike-slip faulting. This zone is characterized by high seismicity and natural hazard potential. One of the most significant recent events ($M_w = 6.3$) occurred on August 14, 2003 northwest of the Lefkada island. The maximum intensity has been evaluated as $I_0 = VII+$ to VIII in the town of Lefkada. Using 20 available SAR images acquired by the ESA ENVISAT satellite, we produced 191 interferograms that we used to examine the co- and post-seismic crustal deformations caused by this earthquake. On the base of quality of the backscattered signal the results are divided in groups and from each group a map of coherence is produced. As a result an analysis of the coherent quality of the terrain and a choice of the most proper group for crustal deformation detecting is made. Whereupon seven ascending and nine descending ENVISAT images are used for generating of 21 best ascending and 36 best descending interferograms, respectively. From them, 6 ascending and 8 descending are co-seismic interferograms, sufficiently coherent to show a deformation of the Earth's surface of 5.6 cm in the western part of the Lefkada Island. These results are compared with the GPS measurements available on the island, and show adequate agreement. A dislocation model using the Okada formalism is proposed.

References:

Hollenstein Ch., M.D. Müller, A. Geiger, H.-G. Kahle (2008). GPS-Derived Coseismic Displacements Associated with the 2001 Skyros and 2003 Lefkada Earthquakes in Greece. *Bulletin of the Seismological Society of America*, Vol. 98, No. 1, pp. 149-161.