Geophysical Research Abstracts
Vol. 16, EGU2014-12943, 2014
EGU General Assembly 2014


# Study of the Zemmouri-Boumerdes earthquake of May 21ST, 2003 – from Teleseismic and SAR data

Rúben Santos (1,2), Bento Caldeira (1), Mourad Bezzeghoud (1), and José Borges (1)

(1) University of Evora, ECT, Geophysics Centre of Evora (CGE), Physics dept, Evora, Portugal (rubenchaves@gmail.com), (2) Portuguese Hydrographic Institute, Marine Geology Dep, Rua das Trinas, 49, Lisboa

This work is a study of the earthquake (Mw=6.8) occurred May 21, 2003 in Zemmouri (Algeria) through a methodology based on teleseismic data, uplift measurements and synthetic aperture radar (SAR) data with the objective to evaluate two solutions for the geometry of the fault (A – strike = 64º; dip = 50º and rake = 97º; B – strike = 256º; dip = 40º and rake = 91º).
The interferometric fringes revealed a strong displacement in the satellite direction (∼53 cm) along the coast of Algeria, between the cities of Boumerdes and Zemmouri. The inversion of the Body wave (Kikuchi and Kanamori, 1991) for the two focal solutions (one plane dipping to the South and the second plane dipping to the North) showed distinct ruptures. However both bilateral with two asperities, one near the hypocenter and another shallower. The maximum slip (model A = 3.8 m and model B = 4.0 m) occurred near the hypocenter, in both rupture models. The surface displacements model was obtained by Okada equations (Okada, 1992) using the EDCMP algorithm (Wang et al., 2003), for the two rupture models and these 3D displacements were projected in the satellite direction (LOS – Line-of-sight) to compare with the interferogram.
The geographic location of the fault plane was determined by comparing the coastal uplift measurements over several vertical profiles, parallel to the coastline and the synthetic ones produced by the model. The best solution corresponds to the minimum standard deviation between them.
The surface displacements calculated from these source models indicate that the model based on the plane A produces results closer to the interferogram and the uplift measurements of the coastline.

References

Kikuchi, M., & Kanamori, H. (1991): “Inversion of complex body waves—III”.Bulletin of the Seismological Society of America, 81(6), 2335-2350.
Okada, Y. (1992): “Internal deformation due to shear and tensile faults in a half-space”. Bulletin of the Seismological Society of America, 82(2), 1018-1040.
Wang, R., Martín, F. L., e Roth, F. (2003). “Computation of deformation induced by earthquakes in a multi-layered elastic crust—FORTRAN programs EDGRN/EDCMP”. Computers & Geosciences, 29(2), 195-207.