



Relocation of aftershocks, focal mechanisms and stress inversion: Implications toward the seismo-tectonics of the causative fault zone of Ms 7.3 1980 El Asnam earthquake (Algeria)

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The location of the El Asnam earthquake of the 10th October 1980 aftershocks with a gradient velocity model gives better estimate of the three spatial events coordinates than those localized using the homogeneous velocity model. The event position errors were less important particularly on depth. The relocation with the double difference method, HypoDD, of the selected events demonstrates the postage of velocity model since the relocated hypocenters lie around the same positions. The relocated hypocenters delineate the dip of both the central and southern segments with respectively 45° and 54° , the hypocenters are less dispersed and reconstruct the rupture propagation in the NW-SE direction. The concentration of the seismicity goes in the same direction as the rupture. The obtained focal mechanisms with FPFIT of 292 events of the 1980 campaign and 51 of those of the 1982 are of different nature, most of them are thrust as the nature of the main shock focal mechanism but we noticed the presence of a great amount of strike slip mechanisms mostly in the North and south of the rupture zone. This big amount and diversity of these focal mechanisms make the inversion with FMSI possible to obtain the regional stress tensor in the region. The stress inversion in different regions reveals the same direction of the maximum principal stress $[U+F073] 1=N140^\circ E$ with very shallow dip. It suggests almost a homogeneous stress regime. These results are in perfect agreement with the shortening direction inferred from surface mapping, geodetic data and the main shock mechanism. It also agrees well with the predicted Eurasia-Africa plate convergence. However, we found a variation in the stress field nature along the studied region. In the North, South and East we obtained a strike slip regime while on the fault system we obtain a thrust regime. Two years after the mainshock the stress regime obtained is in favor of strike slip regime.