



A stress triggering analysis in a recent seismic series near the Itoiz reservoir, northern Spain

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We study the stress changes and interaction in a recent seismic series occurred near the Itoiz reservoir, in the western Pyrenees, northern Spain. The series initiated on 2004, with an $m_b=4.6$ mainshock on September 18. Several authors have studied, by means of different statistical techniques, the possible relation of this seismicity with the impounding of the Itoiz reservoir, which began in January 2004.

In this work we study the space stress relations and interaction among the main events and the rest of the aftershocks of the series. To do this, we computed the coseismic stress change based on the Coulomb Failure Stress changes (CFS). The fault parameters for the computation of the CFS of the perturbing events were selected from published focal solutions. To define the target fault parameters we took into account the data of the focal solutions of the earthquakes itself, the parameters of mapped faults based on the tectonic setting and those of optimally oriented faults. Due to the absence of the slip distribution information of the main earthquakes of the series, and because not enough near field, nor far field data were available to perform a reliable kinematic inversion, we assumed a semi-elliptical distribution of slips over the fault, which is expected from a nearly uniform stress drop. In order to suppress the edge effects, we tapered them with a cosine function in the two spatial directions (strike and dip) for all modeled events. We considered different threshold values of CFS for the effective static triggering.

Results show the existence of different stress interactions among the main events and the stress triggering of the aftershocks due to the previous events. On the other hand, the possible triggering of the main events due to the impoundment of the reservoir is

also being explored.