

Recent and Active Tectonics Related to the Large Seismicity in Al Hoceima Region (Rif Cordilleras)

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The Al Hoceima regiyn, located in the Rif Cordillera near the Alboran Sea, is one of the sectors of the westernmost Mediterranean that show most intense seismicity. The two large recent events (February 24, 2004, M=6,3 and 26 May, 1994, M=5,5) are integrated in the frame of a continuous seismic activity.

This region is located at the boundary between Internal Zones, outcropping at the Bokoya Massif and the External Zones of the Rif, mainly formed by the Ketama unit, separated by well represented Flysch units. However, the major structures, like thrust contacts and the sinistral Nekor fault, formed during the Miocene southwestwards motion of the Internal Zones, seem to be inactive at present.

Seismological data including earthquake focal mechanisms and hipocenters indicate that major present-day seismogenetic faults are located at shallow depths (14 km for the February 24, 2004 earthquake), have NNE-SSW orientation and strike-slip kinematics. However, field researches do not allow to confirm that these large crustal faults reach the surface. The present-day abrupt relief of the region and the presence of marine terraces clearly point the elevation of the coast, confirming that Rif Cordillera continue to be uprising. A set of N-S oriented normal faults, with eastwards and westwards dipping senses show evidences of recent and present-day activity, and determine the development of sedimentary basins, like the Al Hoceima Bay and the Boudinar basins, separated by horst structures like Ras Tarf.

This setting allow to propose the activity at present of large crustal detachment faults that separates the uppermost crust and the seismogenetic faults located at middle crustal levels. These detachment structures may be similar to the Miocene detachments that are exposed in the Betic-Rif Cordilleras.

Key words: Al Hoceima, crustal active faults, detachment, seismic activity.