

Geometric and kinematic evolution of the Middle Atlas mountain belt (Morocco) during the late Cenozoic

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The Middle Atlas mountain range represents the north-eastern branch of the Atlas system and spans approximately 2000 Km from the Atlantic coast of Morocco to Tunisia. The Atlas system constitutes one of the most prominent examples of active intracontinental mountain belts that developed in the African plate of the Cenozoic Alpine belt.

The Middle Atlas together with the High Atlas belts are inverted Mesozoic rift systems that began to rise during the Middle Eocene. Crustal deformation in the Middle Atlas is characterized by the predominance of transpressive tectonics. This is consistent with the oblique orientation of the chain with respect to the direction of maximum compression, which is NNW-SSE in northern Morocco at least during the Quaternary. Seismicity and geomorphic landforms suggest that tectonic deformation is still active.

In order to investigate the tectonic evolution of the Middle Atlas, we combined structural and geomorphic analysis. Our field observations suggest that the western boundary of the orogen, does not present evidences of recent tectonics (at least during the last 2Ma). In addition, the western foreland does not include syn-orogenic basins suggesting the lack of flexural subsidence. Conversely, although the age control of continental syn-orogenic deposits is limited, the eastern boundary of the orogen shows evidences of more recent deformation and flexural subsidence with the development of a foreland basin.

This suggests that the eastern orogenic boundary has accommodated a higher magnitude of Late Cenozoic contractional deformation.

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