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Late Paleozoic Geodynamic Framework of the North African Platform

Francois Leparmentier[1]

[1]Total SA

ABSTRACT

The North African Platform was situated on the northwestern margin of the Gondwana supercontinent during the Paleozoic period. Low tectonic instability and continental to shallow marine environments prevailed during the Early Paleozoic as the area consisted of a rifted domain evolving to a passive margin bordering the Rheic Ocean. Following the Late Silurian Caledonian orogeny only observed through far-field effects on the North African platform, the Hercynian orogeny led to more structural complexity, as documented by thrusting of the Anti-Atlas and Ougarta fold belts, peripherical folding, as well as several erosional events marked by prominent unconformities. Block faulting and uplift processes occurred in the Late Devonian during a transitional period between the climax of the Caledonian and Hercynian deformations. This resulted in a “basin and swell” typical geometry which is illustrated by the Base Mesozoic sub-crop map. The morphology and relief of the resulting Hercynian surface had a clear impact on subsequent events such as the Tethyan rifting which occurred in the Early Jurassic. A conspicuous effect of the Hercynian event consists of the several thousand meters-thick Carboniferous and Permian successions which developed on the northern margin of the African Platform, revealing accelerated subsidence. The structural context of the resulting sedimentary record is still poorly understood and discussed. The presentation illustrates the transition from the Early Paleozoic passive margin to the Late Paleozoic tectonic convergence configuration, with a focus on the “basin and swell” geometry and the Carboniferous/Permian sedimentary record.