First Moscovian paleomagnetic pole, age-constrained by a fold test, from In Ezzane area in the Murzuq basin (Algeria, Stable Africa): Improvement of the Gondwana APWP

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Abstract: To improve the African Apparent Polar Wander Path (APWP), numerous paleomagnetic studies were devoted to the Saharan craton in Algeria during the last decades. Widespread remagnetizations of Permian and Cenozoic ages were pointed out in most works for Lower to Middle Paleozoic formations (Aïfa, 1993; Henry et al., 2004). On the contrary, for the series of Bashkirian age and younger, primary magnetization was often established. The obtained results greatly improved the African APWP from the Lower Carboniferous to Liassic times (Derder et al., 2006 and references therein; Kies et al., 1995; Derder et al., 2001, 2009).
However, APWP needs to be enriched by new data to be better specified. The results of a new paleomagnetic study are presented here. This study has been conducted in the Upper "Dembaba" geological formation of Lower Moscovian age, outcropping in the western part of the "Murzuq" basin (Saharan platform). Well-defined ChRMs, combined with remagnetization circles data, both constrained in age by a positive fold test, yield a new significant paleomagnetic pole (λ=25.2°S, ϕ=59.9°E, K=55, A_{95}=5.4°). When combined with previous African data of the same age, it gives an improved reference pole for Africa (λ=28.9°S, ϕ=54.5°E, K=106, A_{95}=3.6°). The Mean Moscovian paleomagnetic pole determined from the updated Gondwana Paleozoic APWP (Fig.1 - λ=29.4°S, ϕ=51.5°E, K=11, A_{95}=1.8°), associated with the corresponding Laurussia pole (Domeier et al., 2012), yields a more constrained Pangea paleocontinental reconstruction for 310 Ma.

Keywords: Paleomagnetism, fold test, Moscovian, Africa, Gondwana

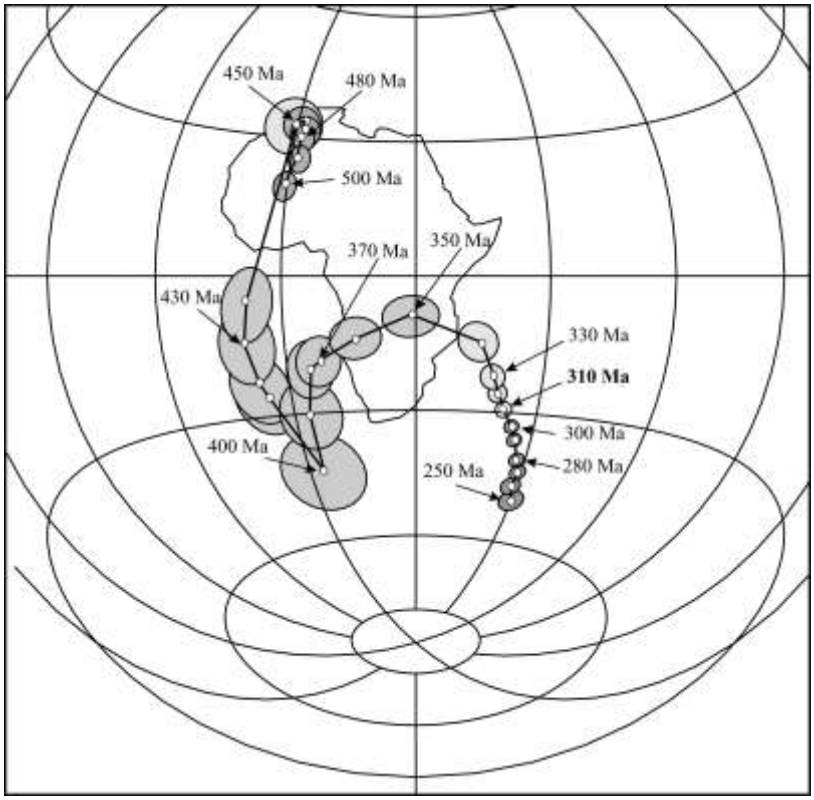

Fig. 1: APWP for Gondwana on North West African coordinates for the Paleozoic time

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