Paleomagnetic dating of continental geological formations: Strong diachronism evidenced in the Saharan platform and geodynamical implications

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Abstract: The paleomagnetism is a powerful tool to date formations that have age not constrained by paleontological, stratigraphical or radiochronological data. It was applied to the Zarzaïtine formation on the western border of the Murzuq basin in Algeria (Saharan platform). The obtained paleomagnetic pole has been compared with previous pole obtained from the same geological formation in the Illizi basin (Kies et al., 1995), where it is dated of Middle Triassic to Rhaetian age (Aït Ouali et al., 2011), and poles from African formations of neighboring age and with the Gondwana APWP (Amenna et al., 2014). This comparison yielded a clearly older age (Late Permian) than expected. That evidences a strong diachronism (at least 40 My) of the deposition of this formation and therefore a different post-Hercynian evolution according to the parts of this platform, with significant differential tectonic vertical movements, at the origin of erosion, hiatus or sediments deposition according to areas.

Keywords: Dating, Paleomagnetism, Permian, Diachronism, Africa

References :

- Aït Ouali, R. Nedjari, A., Taquet, P., Bitam, L., Tayeb-Cherif, L., Bouras, R., 2011. Le Zarzaïtine inférieur (In Amenas, Sahara algérien). Derniers développements dans une série du Trias pro-parte. Mém. Serv. Géol. Nation. Algérie, 17, 6-26.
- Amenna, M., Derder, M. E. M. Henry, B. Bayou, B. Maouche, S., Bouabdallah, H. Ouabadi, A., Beddiaf M., Ayache M., 2014, Improved Moscovian part of the Gondwana APWP for paleocontinental reconstructions, obtained from a first paleomagnetic pole, age-constrained by a fold test, from In Ezzane area in the Murzuq basin (Algeria, Stable Africa). J. African Earth Sci. doi: 10.1016/j.jafrearsci.2013.12.006.
- Kies, B. Henry, B., Merabet, N., Derder, M.E.M., Daly, L., 1995. A new Late Triassic - Liassic palaeomagnetic pole from superimposed and juxtaposed magnetizations in the Saharan craton. Geophys. J. Int., 120: 433-444.