

## **Compressional magnetic fabrics in the Jurassic-Cretaceous continental basins of the northern Central High Atlas (Morocco): geodynamic implications**

B. Moussaid<sup>(1)</sup>, H. El Ouardi<sup>(1)</sup>, A. Casas<sup>(2)</sup>, J. J. Villalain<sup>(3)</sup>, T. Román<sup>(2)</sup>, B. Oliva<sup>(2)</sup>, R. Soto<sup>(4)</sup>, S. Torres<sup>(3)</sup>, A. Mahmoudi<sup>(1)</sup>.

(1) Département de géologie, Faculté des Sciences, université Moulay Ismail, Meknès, Maroc. [bnmous@hotmail.fr](mailto:bnmous@hotmail.fr)

(2) Dpto. de Geología, Facultad de Ciencias, Universidad de Zaragoza, 50009 Zaragoza, Spain

(4) Instituto Geológico y Minero de España, Zaragoza, Spain

(3) Dpto. de Física. Escuela Politécnica Superior. Universidad de Burgos. Avd Cantabria S/N, 09006 Burgos, Spain

The study area is the High Atlas that forms part of the Alpine Atlasic Belt. It is an intraplate belt, resulting from the inversion of strike-slip basins.

Our study focuses on two Jurassic-Cretaceous basins; Aït Attab and Ouaouizaght. The stratigraphic series of the two basins are mainly Bathonian and Cretaceous in age. The Bathonian sediments are represented by continental clays and sandstones. The Cretaceous units consist in an alternating sequence of continental clays and red sandstones with marine yellowish marly limestones.

In order to study the history of strain fields in both basins and verify the origin of curved shape of the Ait Attab basin a study of the anisotropy of magnetic susceptibility (AMS) has been done. We performed a detailed regular sampling of the Bathonian, infra-Aptian, Aptian-Albian and Cenomanian units. About 430 samples were drilled from 42 sites, with a minimum of 11 samples per site (20 sites in Aït Attab and 22 in Ouaouizaght). In addition to systematic AMS measurements, different experiments of rock magnetism such as hysteresis loops, thermomagnetic curves, etc., have been performed in order to decipher the minerals carrying the magnetic susceptibility signal.

Susceptibility values (Km) in Ait Attab basin vary between 60 E-06 and 220 E-06 S.I. units. In the Ouaouizaght basin, Km varies from 90 E-6 to 220 E-6 S.I. Mean Jelinek parameters were calculated for each station. The shape parameter T shows positive values in most sites, reflecting an oblate magnetic fabric.

The temperature curve for red facies shows a sharp drop in magnetic susceptibility in the vicinity of 680 ° C when heated. This indicates that hematite is probably the mineral carrier of the anisotropy of magnetic susceptibility. In the white marly facies the temperature curve shows a complex behavior sometimes, but still showing the dominance of paramagnetic minerals as carriers of the magnetic anisotropy.

In the Aït Attab basin, most of the maximum susceptibility (K1) directions from the Bathonian and Cretaceous sediments revealed a constant direction (N-S) of layer-parallel shortening (LPS). In the Ouaouizaght basin, the Bathonian units display K1 directions (E-W) consistent with a N-S shortening. The Cretaceous sediments show two main K1 directions; one is about NNE-SSW and is formed by some sites where a permutation between K1 and K2 is observed, the second direction is almost E-W similar to the Bathonian K1 direction, which is consistent with a N-S LPS, similar to the magnetic fabric observed in the Aït Attab basin. The E-W K1 directions can be interpreted as a result of N-S shortening resulting from inversion of strike slip basins (parallel to the axes of main folds), while the oblique NE K1 directions, can be interpreted as the result of the original fabric formed during the basinal stage, consistent with the strike-slip transtensional displacement of NE-SW to N-S faults.

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