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Magnetic fabrics in overthrusted terrains: example from the Buntsandstein Facies in the southern edge of the Axial Zone (Nogueres unit, Central Pyrenees)

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Magnetic fabrics in deformed domains are a source of information of the strain rate and the tectonic evolution of the rocks. The present study shows the results derived from the application of this methodological approach to the Permian-Triassic red beds in the western sector of the Nogueres unit and eastern sector of the Gavarnie thrust sheet (Central Pyrenees). From the structural point of view, the sampled domain constitutes a key area since it is located in the transition between the antiformal stack of the Axial Zone to the West, including non-overturned basement thrust sheets, and the *têtes plongeantes* domain of the Nogueres unit to the East. The latter comprises three folded thrust sheets, involving Stephanian, Permian and Triassic rocks, whose fronts define several synformal anticlines. Alpine cleavage is generally absent within the *têtes plongantes* domain but Triassic outcrops located North and West are affected by WNW-ESE-striking, North-dipping cleavage planes.

Samples for the study of the anisotropy of magnetic susceptibility were collected from 31 sites, distributed throughout the different structural domains (in the *têtes plongeantes* domain and in the red beds unconformably overlying the Paleozoic, North and West of the Nogueres unit). Measurements of the magnetic fabric were made at room and low temperature ($\sim$77ºK) with a KLY-3S susceptibility meter (AGICO, Czech Republic) that combined with a CS-3 apparatus was also used to perform thermomagnetic runs. Mean magnetic susceptibility (Km) in the sampled sites ranges between 35 and $221 \cdot 10^{-6}$ S.I. It is lower in the sandstones ($<162 \cdot 10^{-6}$ S.I.) and shales containing carbonate paleosols ($<132 \cdot 10^{-6}$ S.I.) and higher in the homogeneous red shales (between 189 and $221 \cdot 10^{-6}$ S.I.). Thermomagnetic runs show the contribution of both paramagnetic and ferromagnetic (hematite) minerals as carriers of the magnetic fabric. The contribution of both components is also consistent with the mean magnetic susceptibility values at low temperature that are approximately twice the Km measured at room temperature. The axes of the magnetic susceptibility ellipsoid at low and room temperature overlap, suggesting that the orientation of paramagnetic minerals (mainly phyllosilicates) and hematite coincide.

Three different structural and magnetic fabrics domains can be distinguished in the study area: (1) the western area, without *tête plongeante* structures, where oblate fabrics are dominant and K_3 is always perpendicular to bedding, (2) the area located North of the *têtes plongeantes*, where prolate ellipsoids and K_3 axes perpendicular to cleavage or forming a girdle with K_2 are frequent and (3) the area of *têtes plongeantes* with oblate magnetic ellipsoids and K_3 axes perpendicular to bedding. K_1 has a dominant WNW-ESE trend, parallel to the structural direction, throughout the study area. K_1 attitude is consistent with the overall Pyrenean compressional structure. However, preliminary paleostress results considering normal syn-sedimentary faults as well as the better grouping of K_1 axes after tectonic correction indicate that magnetic fabrics related to extensional tectonics prevailing during Triassic times could be preserved in part of the study area.