



Comparison between extensional AMS ellipsoids and brittle mesostructures in the Basque-Cantabrian basin (N Spain)

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In this work we analyse and check the results of anisotropy of magnetic susceptibility (AMS) by means of a comparison with stress ellipsoid orientations obtained from palaeostress analysis in rocks from the Cabuérniga Cretaceous basin, an extensional basin located in the western end of the Basque-Cantabrian basin in North Spain. The data refer to 29 sites that comprise Triassic red beds, Upper Jurassic and Lower Cretaceous limestones, sandstones and shales (Cabuérniga and Pas Groups). These deposits are weakly deformed and represent the syn-rift sequence linked to an extensional stage generalized in the Iberian plate. The extensional basin was later inverted during the uplift of the Pyrenees. Previous studies reveal that a syn-folding remagnetization occurred linked to the extensional stage.

The observed magnetic fabrics are typical of early stages of deformation, and show oblate, triaxial and prolate magnetic ellipsoids. The observed magnetic fabric seems to be related to a tectonic overprint of an original, compaction, sedimentary fabric. Most sites display a N-S to NE-SW magnetic lineation that is interpreted to represent the stretching direction of the extensional stage of the basin, without recording of the compressional events, except for sites with compression-related cleavage.

Brittle mesostructures include syn-sedimentary faults, calcite and quartz tension gashes and joints. All the structures analysed probably formed during the extensional stage, as can be assessed from the relationship between bedding and structure orientation and features of fault planes. The results obtained from tension gashes show a dominant N-S to NE-SW with secondary NW-SE extension direction. Paleostresses obtained from fault analysis (Right Dihedra and Etchecopar's methods) indicate a

dominant NW-SE to E-W extension direction, probably related with lateral collapse during dominant NNE-SSW extension.

The results obtained are consistent with a dominant N-S to NE-SW extension, related with the activity of the main normal faults limiting the Cabuérniga basin (the E-W Cabuérniga fault to the North and the NW-SE Rumaceo fault to the South), and linked to the opening of the Bay of Biscay during the Early Cretaceous.