
Tectonic fabrics in inverted basins: a case study in the Iberian Chain

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Résumé

Tectonic inversión of extensional basins is one of the main processes of intraplate deformation in compressional contexts. The interpretation of the geological process that occur during the extensional stages can be hindered by the lack of extensional features, especially in context of low subsidence (intra-plate basins or platform domains), as well as in post-rift or thermal subsidence periods. In inverted basins, the Anisotropy of the Magnetic Susceptibility (AMS) and specifically the magnetic lineation, is widely used to record extensional, weak rock deformations because of its proved sensitivity. This technique has been recently applied in inverted basins of the Iberian Range (i.e. Cameros and Maestrat Basins) where magnetic lineation draws a reliable picture of the stretching direction associated to the Upper Jurassic–Lower Cretaceous rifting period. The goal of this work is to interpret the strain field recorded in the Mesozoic, with particular emphasis in the Mid-Cretaceous, post-rift sedimentary succession in the Iberian Range through the study of AMS. Sampling is majoritary focused on the Albian Utrillas Fm, a siliciclastic unit that lies between the rift and post-rift sequences. Clays of Triassic levels, Jurassic successions and the Upper Cretaceous limestones were also sampled to obtain a complete look on the deformational regime. In all sites sampled in the Utrillas Fm, the magnetic lineation shows NW-SE trends, in parallel to the strike of the bedding and to the trend of the major Alpine structures. In the other units, magnetic lineation shows several directions: NE-SW, E-W and N-S in the Triassic and Lower Cretaceous units, while in the Upper Cretaceous platform remains NW-SE. Magnetic fabrics are therefore interpreted both in relation to the extension and to the positive inversión during Alpine compression, depending on their location with respect to the significant structures. These results differ to the ones obtained in the nearby, syn-rift sedimentary series of the Cameros or Maestrat Basins, where extensional stretching lineations are majoritary. We interpret that the weak extensional regime that characterize the post-rift stages could imprint a poor developed stretching lineation, that could have been preserved only in particular sites and easily overprinted by Alpine compression. Funding: PID2019-108753GB-C2.

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