

Fracture patterns around the Conejera buttress of the Asturian Basin (North Iberian Margin): indicators of direction of rifting and convergence?

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The Conejera buttress structure is located on the onshore portion of the Asturian Basin of the North Iberian Margin. The basin is dissected by a series of E-, NE- and NW- striking fault systems. The NE-striking and SE-dipping Conejera Fault displays a fantastic example of compressional buttressing deformation, governed by the mechanical contrast between a semi-rigid footwall and a multilayered unit on hanging-wall strata. The Conejera fault is probably a cover structure soled along Rhaetian-Hettangian evaporites, but may be kinematically linked to a basement-involved extensional fault system in depth. This extensional system most probably resulted from the Late Jurassic-Early Cretaceous reactivation of deep-seated Permian and/or late Variscan structures. Subsequent latest Cretaceous to Cenozoic convergence generated the mentioned buttressing deformation gradient.

The meso-structural deformation pattern around the Conejera buttress structure consists of faults and fractures related with Late Jurassic-Early Cretaceous rifting, overprinted by later convergence. In domains with poor compressional deformation, our structural analysis reveals rift-related hanging-wall joints and meso-faults trending oblique to the main NE- and NW-striking basin bounding faults. These relationships suggest an obliquity between the major faults and the regional extension direction (i.e. striking about N015E based on the studied fracture patterns). We interpret this extensional direction as responsible for the opening of the northerly Bay of Biscay. Lack of any remarkable strike-slip fault zones in the Conejera buttress, along with the orientation of the buttressing-related meso-structures (i.e. folds, faults and pressure solution), suggests a roughly NW-oriented direction of convergence in the North Iberian Margin.