



## **The buffering effect of a continental block on the reactivation of a hyperthinned rift basin: the Asturian Basin and the Le Danois High in the southern Bay of Biscay**

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V-shaped rift basins and associated continental blocks have been described along the Atlantic rifted margins. However, the role of these crustal blocks during the subsequent tectonic inversion has not been extensively studied. An example of such a block is the Le Danois High at the central part of the southern Biscay margin, limiting the Asturian Basin to the north. This basin developed mainly during Late Jurassic to Barremian rifting and was subsequently slightly inverted in the Cenozoic during Alpine orogeny. Relying on the interpretation of a borehole-constrained 2D seismic reflection dataset and on the integration of all the available velocity models, we present the crustal structure and the stratigraphic architecture of the Asturian Basin and the Le Danois High.

The Basin is an asymmetric rift basin reaching a maximum depth of about 13,5 km at its main depocentre, which was developed on top of a highly thinned, less than 11 km thick crust. The Basin is limited southwards by a major north-dipping extensional fault that has been inverted. At its northern margin, the Le Danois High corresponds to a relatively thick acoustic basement block bounded by hyperextended crust at its southern and northern sides, suggesting that it represents a rift-related continental block inherited from the margin architecture. The observation that this block separates a mildly inverted rift basin to the south (e.g., the Asturian Basin) from an accretionary wedge to the north shows that this block buffered the compressional deformation. Indeed, this block, inherited from the rift architecture can explain that the Asturian Basin was only weakly reactivated, despite the fact that it overlies hyperthinned crust and that most of the shortening was accommodated by underthrusting of the hyperextended domains of the southern Biscay margin beneath the Le Danois High.

The presence of the Le Danois High as an inherited extensional relict can explain the strong segmentation during both, the extensional and the compressional events. It also illustrates the strong effect on compression of variable crustal thicknesses on along the same rifted margin.