



Reactivation of a segmented hyper-extended rift system: the example of the Pamplona transfer zone in the western Pyrenees

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Numerous studies have revealed the importance of rift-inheritance on the formation of orogens but little consideration was given to rift segmentation and the role of transfer zones on the architecture of mountain chains. Indeed, structural mapping of passive margins pointed out the occurrence of a strong variability in the rift architecture along the margin when crossing through peculiar features that represent transfer zones. These transfer zones are generally oriented in the extension direction and relay the deformation between rift segments.

The aim of this study is twofold: 1) characterize and define the Pamplona fault system as well as the structures and architecture of the basins bounding this major paleo-transfer fault located in the Western Pyrenees, and 2) understand its role during the subsequent Pyrenean convergence. The influence of the Pamplona fault system on the structuration of the Mauléon basin to the northeast and the Basque-Cantabrian basin to the southwest is substantial as expressed by their large offset and the occurrence of exhumed deep crustal and mantle rocks flooring the two basins. On the one hand, field work in the Labourd Massif and the western termination of the Mauléon basin enabled to describe faults and their relations to sedimentary sequences. This work also allowed describing the formation and reactivation of faults according to their orientation and their activity with respect to key markers (pre-Triassic and post-Cenomanian). A strong relationship between rift architecture (proximal to distal domains) and structural inheritance is suggested. On the other hand, preliminary results from fieldwork, literature compilation and new tomographic imaging enable to determine the role and the history of the Pamplona fault system during Late Cretaceous compression. A significant work of this starting PhD project will be to determine the rift structures that have been reactivated and to assess their influence on the final architecture of the western Pyrenees.