

Lithosphere and crustal necking at rifted margins: what can be seen in seismic reflection data?

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Lithospheric and crustal necking correspond to one of the key stages in the evolution of hyperextended rifted margins. Although necking has been described in previous studies, the processes of how the lithosphere and crust thin, when and how it occurs and how it is imaged in reflection seismic sections are yet little investigated. The PhD study is based on the observation, interpretation and quantification of necking processes occurring at different rifted margins with different thermal, structural and compositional inheritance. The aim is to describe and quantify the major crustal thinning processes occurring at the transition between the proximal and the distal margin, understand the crustal and stratigraphic architecture and, if present, the link to magmatic additions forming during crustal necking. Understanding the variability of the structures, the controlling parameters and the underlying processes linked to lithospheric/crustal necking is a key to understand the temporal and spatial evolution of rifted margins.

In our presentation, we will show: 1) the crustal architecture of necking domains, and 2) the sedimentary/magmatic record related to necking. This will enable us to understand and determine the tectono-sedimentary evolution, subsidence history, deformation mechanisms and isostatic response during necking at rifted margins. The approach that we are going to develop in the PhD project will build on existing data and methodological approaches that include and link between the observations and geophysical methods. While the former will provide conceptual ideas and testable hypotheses, the latter enables to test and quantitative interpretations.