



Nature of basement highs in ultra-distal ocean-continent transitions: on- and off-shore examples

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Despite the fact that many studies investigated magma-poor rifted margins, there are still questions that are related to the nature and the origin of basement highs in ultra-distal Ocean-Continent Transitions (OCT). Indeed it has been observed that the morphology of the OCT of magma-poor rifted margins is structured and complex. The aim of this study is to determine the nature of these basement highs, their 3D morphology, the processes associated to their creation, and the timing related to their formation. To do this, we focused on distal seismic lines with well data from the Iberia and Newfoundland margins and on field observations of the Platta nappe, which exposes an about 300 km² large, little overprinted remnant of a fossil OCT belonging to the Alpine Tethys, exposed in the area of Bivio in SE Switzerland.

The first results are the establishment of criteria allowing the identification of the different types of basement highs or groups of basement highs using offshore and onshore data. The main criteria are: the top-basement morphology, seismic reflectivity patterns, rooting depth of basement highs, the size, the related sedimentary architecture, the relative location in the margin, and if possible to determine, the magmatic budget. These criteria allow us to define 4 different types of highs that are: 1) footwall crustal wedges, 2) hanging wall extensional allochthon blocks, 3) peridotite ridges, and 4) outer highs.

The overall observations provide important information on the temporal and spatial organization of the structural and magmatic systems. These systems are at the origin of the creation of ultra-distal OCTs which are important for the understanding of the processes controlling the final rifting stage. The goal of this study is to use an observation driven approach and to create identification criteria that can be used to describe the nature of basement highs at not yet drilled distal magma-poor rifted margins.