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The tectono-stratigraphic evolution of basement highs in hyper extended deep-water rifted margins : the example of the Briançonnais domain in the Alps and comparisons with modern analogues

Isabelle Haupert (1), Gianreto Manatschal (1), Patrick Unternehr (2), and Alessandro Decarlis (1)

(1) IPGS-EOST/UDS-CNRS, 1 rue Blessig 67084 Strasbourg-Cedex, France, (2) TOTAL-Exploration Production/Projets Nouveaux, Place Jean Millier, La Défense 6, 92078 Paris La Défense, France

The discovery of hydrocarbon systems in hyper-extended deep-water rifted margins, in conjunction with technical developments, expanded the hydrocarbon exploration into domains that are yet little investigated. The increasing number of high-quality reflection and refraction seismic surveys and drill hole data show that deep-water rifted margins are very different from proximal rifted margins. The new data show evidence for a polyphase rift evolution resulting in complex rift architectures with variable amounts of magmatic addition and local mantle exhumation that cannot be predicted by classical rift models. Thus, understanding the thermal structure, subsidence history, depositional environment and sedimentary architecture is a prerequisite to apply the "play elements" in these yet little investigated domains, which is essential to evaluate the survivability of syn- to post-rift petroleum systems.

Although a big progress was made in the understanding of deep water rifted margins in the last 5 years, there are still many fundamental questions that remain open and ask for further research on this topic. One open scientific question is related to the tectono-sedimentary evolution and subsidence history of basement highs in deep water rifted margins. Péron-Pinvidic and Manatschal (2010) showed that different types of basement highs can be distinguished in rifted margins. These highs include micro-continents, continental ribbons, H-blocks and extensional allochthons. Mapping these highs and properly define their stratigraphic and tectonic evolution provide important insights into the tectonic evolution of rifted margins.
However, these blocks are often at deep-water and sealed by thick post-rift sediments. Therefore access to direct observations requires expensive drillings. An alternative way to study these blocks is to use field analogues. One of which is the Briançonnais domain in the Alps.
To achieve our goal we propose to review the existing structural, stratigraphic and age data from the whole Briançonnais domain (from Liguria/Italy, across the French Alps to Grisons in Switzerland). We propose to construct key tectonic sections across the Briançonnais domain. These data will form the basis to discuss the rift-related tectono-stratigraphic and subsidence evolution and to constrain the along and across strike stratigraphic architecture of the Briançonnais. These observations will be compared with that of seismically imaged basement highs in deep-water rifted margins (e.g. outer high in Campos or Santos).

In our presentation we will show results of our preliminary works on the Briançonnais domain in the French Alps and a comparisons with seismically imaged basement highs imaged offshore Newfoundland.