

Effect of pre-salt relief on the evolution of salt-bearing passive margins: physical model and comparison with Santos Basin (Brazil)

Eugeni Benaiges Torija

Tutors: Oriol Ferrer ¹ and Leonardo M. Pícher

Reservoir Geology and Geophysics

Universitat de Barcelona (UB), Universitat Autònoma de Barcelona (UAB) and Geomodels
Research Institute

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Abstract

Salt-bearing passive margins are economically important because the salt-related structures can be potential traps of hydrocarbon resources. One of the most important parameters is the time of the deposition: pre-, sin- or post-rift.

Using an experimental approach based on systematic scaled physical models, the aim to this project is threefold: 1) to understand the effect of the pre-salt relief and his geometry on the structural style 2) to understand the origin of the Albian Gap. To understanding of these two points will allows indirectly to infer the role of salt in the Santos Basin (Brazil). The experimental program included 2 physical models.

Models were carried out at the Geomodels Analog Modeling Laboratory (UB) and were recorded using three-high quality digital cameras (overhead, oblique and sections) controlled by computer. Sections photographs were used as a seed to build 3D image voxels. Overhead photographs were used to do 2D Digital Image Correlation (2D DIC) and to create a video of the kinematic evolution of each model.

Regardless of the modelled factor, the experimental results demonstrate that the structural style results are dramatically constrained by the pre-salt relief and geometry of this. The passive margins are dominated by zones of extension and contraction controlled by the pre-salt relief. The origin of the Albian Gap can be a combination of the different process. The experimental result is consisted with the structural style described in the Santos Basin.