SALT: from rifted margins to fold-and-thrust belts. Insights from analogue modelling and case studies

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Salt and related structures have a strong influence on the formation of extensional basins during lithospheric stretching and thermal subsidence at rifted margins. Salt significantly influences as well the structural styles and kinematics of fold-and-thrust belts. We aim to characterize the structure of inverted minibasins and salt-influenced fold-and-thrust belts, but the challenge is to understand, and to match, the present day contractional structures with reasonable pre-orogenic configurations. Yet, we still lack proper understanding on the development of these salt-sediment systems and particularly, how salt tectonics is initially triggered and evolves through space and time. Two fundamental triggering mechanisms on rift to passive margin salt tectonics are known: (1) extension by gravitational collapse, and (2) differential loading. Key questions are: do these mechanisms occur at the same time or does one commonly follow the other? Which one is first and which one dominates? Does it depend on the location and timing of deformation on the passive margin? Which are the stratigraphic evidences and structural geometries that may help us to answer these questions? Recognizing the initial structural geometries of these minibasins once they have been incorporated into a fold and thrust belt is challenging but of paramount importance.

In this contribution we address some of these questions by showing a brief historical review of concepts and show end-member analogue models of fold-and-thrust belts developed from the inversion and incorporation of rift to passive margin salt basins. Our work is inspired by field observations from the Pyrenees and the Northern Calcareous Alps, as well as from present day continental margins.