

***From Jurassic Rifting to Alpine Inversion: How well constrained
is the pre-Alpine paleogeography?***

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The Paleozoic to Cenozoic evolution of the Alpine Tethys system in Western Europe remains a subject of numerous debates. Its tectonic evolution is controlled by the collapse of the Variscan orogen, the closure of the Paleo- and Neotethys to the east and the opening of the Atlantic ocean to the west, which constrains the relative movement of Africa relative to Europe. Major changes in the system occur (1) in the late Middle Jurassic, associated with the opening of the Central Atlantic, and (2) in Santonian/Campanian time, coinciding with a change from left-lateral to north directed movements between Africa and Europe. The plate kinematics and paleogeographic reconstructions for the Late Jurassic and Lower Cretaceous of the Alpine domain are mainly constrained by the M-series magnetic anomalies in the southern North Atlantic between Iberia and Newfoundland. Drilling by the Ocean Drilling Project (ODP Legs 103, 149, 173 and 210) and reflection and refraction seismic investigations in the Iberia-Newfoundland margins resulted in the discovery of hyper-extended crust and more than 200 km of exhumed mantle continentwards of the magnetic anomaly M0, which is generally used as the starting point for kinematic reconstructions. Therefore, this discovery has major implications for the interpretation of the Alpine domain and ask for a revision of the existing plate kinematic reconstructions in order to take into account the more than 300 km of observed pre-breakup extension. Furthermore, the discovery of exhumed subcontinental mantle and hyper-extended crust over more than 300 km within the Iberia-Newfoundland rift system predating break-up calls for a re-definition of oceanic crust and continental breakup in rift systems.

In our presentation, we will discuss the implications and consequences of these discoveries for the rift evolution of the Alpine Tethys and its inversion and final reactivation during Alpine collision.