Iberia-Europe convergence and Adria subduction initiation unraveled by basins evolution

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In the northwestern Mediterranean, microplates configuration at early stages of convergence is matter of debate. Two are the main reasons. First, magnetic anomalies in the Atlantic cannot give any control on plates motion. Reversals in Earth's magnetic field are indeed missing for large part of the Cretaceous. Second, structures due the early interaction between the microplates have been largely destroyed by the more recent evolution in Alps, Pyrenees and Apennines. Sediments were nevertheless deposited along long-living structures in the whole northwestern Mediterranean. The sedimentary basins are thus the only large-scale feature available for the comprehension of the system at the end of the Cretaceous.

We review the Late Cretaceous to Eocene depositional systems at the junction between the Alps, Pyrenees and Apennines. We build paleogeographic maps integrated in a tectonic and plate kinematics framework on GPlates. The paleogeographic maps synthetize the regional pattern of uplift and subsidence and show also the distribution of compression and extension in the northwestern Mediterranean. We integrate metamorphic and volcanic data and we use the whole database to identify the spatial and temporal evolution of the plate boundaries during the Late Cretaceous to Eocene. Finally, we suggest timing and mode of Adria subduction initiation.