ECOLE LEMANIQUE DES SCIENCES DE LA TERRE
DES UNIVERSITES DE GENEVE ET DE LAUSANNE

Master ès Sciences in geology

SEDIMENTARY PETROLOGY AND PROVENANCE OF THE CASTISSENT FM SANDSTONES

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Context

Integrating sedimentary petrology and provenance analysis in source-to-sink studies improves the understanding of sediment routing systems and basin fill evolution. The South Pyrenean Foreland Basin (Spain) was filled by mixed (clastic/carbonate) sediments deposited in an active foreland basin setting during Late Cretaceous to Oligocene times. A detailed petrological study will be undertaken in several samples from the early Eocene Castissent Formation, a major fluvial clastic excursion and from its time-equivalent shallow and deep marine depositional systems, in order to report on its provenance and major sediment pathways. The results will be correlated with a parallel project in the coeval Corçà Formation, across the Montsec high, with Sr-Sr dating of marine incursions and with carbon stable isotopes on bulk rock carbonates, which should help unravelling potential climatic signals. This work will complement an ongoing multi-proxy project on the high-resolution timing and palaeogeographic reconstruction of the lower Eocene in the South Pyrenean Foreland Basin.

Objectives and Methods

A detailed petrological characterization of the Castissent Fm. from thin sections sampled along different parts of the Tremp-Graus and Ainsa basins will be complemented with a range of advanced analytical techniques (QEMSCAN, SEM-EDS, XRD, XRF) and supported by geochemistry of major and trace elements as well as clay analysis to constrain climatic factors. Additional Sr-Sr dating of marine incursions and carbon stable isotopes analysis on bulk rock carbonates will be also performed.

Literature

Huyghe, D., Castelltort, S., Mouthereau, F., Serra-Kiel, J., Filleaudeau, P.-Y., Emmanuel, L., Berthier, B., Renard, M., 2012. Large scale facies change in the middle Eocene South-Pyrenean foreland basin: The role of tectonics and prelude to Cenozoic ice-ages. Sedimentary Geology, 253-254, 25–46.

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Choice of orientation :

Sedimentary, Environmental and Reservoir Geology