

## EP33C-1962: Quantifying incision rates since the early Miocene: novelties, potentialities and limitations

Wednesday, 13 December 2017

13:40 - 18:00

📍 New Orleans Ernest N. Morial Convention Center - Poster Hall D-F



- **ePoster** - [poster\\_Sartégou\\_AGU.pdf](#)

The rates and chronologies of valley incision are closely modulated by the tectonic uplift of active mountain ranges and were controlled by repeated climate changes during the Quaternary. The Pyrenees are a continental collision between the Iberian and Eurasian plates induced a double vergence orogen, which has been considered as a mature mountain range in spite of significant seismicity and evidence of neotectonics. Nevertheless, recent studies indicate that the range may have never reached a steady state. One option for resolving this controversy is to quantify the incision rates since the Miocene by reconstructing the vertical movement of geometric markers. However, the few available ages from the Pyrenean terrace systems do not exceed the middle Pleistocene. To enlarge the time span of this dataset, we studied alluvium-filled horizontal epiphreatic passages in limestone karstic networks, which represent former valley floors. They record the transient position of former local base levels during the process of valley deepening.

We used various suitable geochronological methods ( $^{26}\text{Al}/^{10}\text{Be}$ ,  $^{10}\text{Be}/^{21}\text{Ne}$ , ESR and OSL burial durations on quartz) on intrakarstic alluvial deposits from three valleys of the central and eastern Pyrenees, as well as on a recent analogue. In the Pyrenean context, under particular conditions, these geochronometers allow us to document incision processes since  $\sim 16\text{-}13\text{ Ma}$ , and to study influences of external forcing and eustatism. In comparison with other studies, it appears that incision rates are higher in the central Pyrenees and for the Spanish slope.

However, the density of horizontal levels on an altimetric range, the geodynamical and paleoclimatic contexts, the reorganization of the drainage networks can make the filling stories of the networks more complex than expected. Indeed, these radiometric approaches may be limited when some formations are reworked inside and/or outside the karst. The validity of dosimetric methods in a mountainous context, and quartz bleaching conditions at the time of deposition will also be discussed.

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### Plain Language Summary

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