



## **Late Quaternary incision rates in the southern French Alps from river longitudinal profiles inversion: climatic forcing and internal adjustments.**

Carole Petit (1), Davide Cassol (1), Yann Rolland (1), and Marianne Saillard (2)

(1) Géoazur UMR CNRS 7329, University Nice Sophia Antipolis-OCA-IRD, Valbonne, France (petit@geoazur.unice.fr), (2) Géoazur UMR CNRS 7329, UNS-OCA-IRD, Valbonne, France (saillard@geoazur.unice.fr)

Southern French Alps, and especially the external crystalline massifs, show evidences of rapid river incision featured by deeply incised gorges and widespread active landslides. The onset of rapid incision is not precisely dated, but cosmogenic nuclide dating of river polished profiles evidences rapid incision (of the order of 2-3 mm.yr<sup>-1</sup>) since 20 ka. These data suggest that it may be related to temperature and runoff increase due to glacier melting after the last glacial maximum (LGM).

In this study, we use river longitudinal profiles from tributaries of the Tinée River, in the Argentera-Mercantour crystalline massif, to determine recent incision rate (IR) variations through time with the inversion method of Goren et al. (2014). Overall, the background IR is of approximately 5 mm.yr<sup>-1</sup>, in agreement with recent IR estimates from cosmogenic nuclide dating in the Tinée River. Incision rate histories of all tributaries show periodic pulses of large IR that could be correlated to quaternary interglacials and interstadials, based on the comparison with global temperature curves. However, some tributaries show very large IR in the Holocene period, whereas others show a recent (post 10 ka) IR decrease. We suggest that local internal adjustments, possibly in relation with meander migration of the main stem, are responsible for these different behaviors.