



Fluvial terrace dating (^{10}Be) and quaternary incision rates in the Amblève valley (eastern Belgium)

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We applied Cosmic Ray Exposure (CRE) dating (^{10}Be) to fluvial terraces of the Amblève River, which drains the northern part of the Ardenne massif, in order to calculate incision rates since the middle Pleistocene. Though CRE dating was successfully used to determine ages of superficial (e.g., glacial) deposits, dating of fluvial terraces remains difficult. Possible predepositional exposures of the sampled material (inherited ^{10}Be) may indeed yield ^{10}Be concentrations higher than that accumulated during the studied exposure while postdepositional processes such as burial, erosion, shifting position may lower the accumulated ^{10}Be concentrations. Moreover, postdepositional reworkings of these fertile terrace deposits are frequent. In an attempt to overcome these difficulties, a terrace classification was firstly carried out to determine the best potential sampling sites considering these specific constraints. Afterwards, the selected fluvial deposits (six locations) have been sampled using a profiling technique as thick as possible (~ 3 m or more). Providing a sufficient thickness of sediment (>6 m) is available, which is the case in two locations, the muonic component of ^{10}Be may thus allow dating terraces as old as the middle Pleistocene Main Level and, consequently, inferring incision rates since this period.