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Characterization of bedload flux variability at Draix, Southern French Prealps, using a Reid slot sampler

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Sediment transport is particularly intense in mountain streams. Although there are important operational issues, sedimentary processes in steep channels are still poorly understood. The long-term field observatory at Draix, Southern French Prealps, is a key site to investigate and better quantify erosion and hydrological processes in badlands landscape (Mathys et al., 2003).
In particular, an automatic Reid bedload slot sampler was deployed in the Moulin Ravine (8.9 ha) in late 2011 (Liébault et al., 2016). It is used to monitor instantaneous bedload fluxes (integrated over 10 s) during a flood under conditions of ultra-high suspended-sediment concentrations (120-320 g/L). Combined with data from scour chains and automatic suspended sediment sampler, it aims (i) to link bedload flux with shear stress and (ii) to better understand the impact of both seasonal forcing and morphological conditions on the variability of bedload response.
The flood events recorded from September 2011 to September 2017 will be analysed (seven major transport events among about thirty floods). The highest 10-s bedload fluxes recorded reach about 40 kg/m/s. A strong anticlockwise seasonal hysteresis of bedload transport is observed and interpreted as a consequence of sediment pulses migration.

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