Hydrological and sediment dynamics in two Mediterranean intermittent rivers

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**Abstract.** The general aim of this study is to investigate the relationships and the processes characterizing flow regime and suspended sediment (SS) transport in two intermittent rivers, the Búger (Spain) and the Carapelle (Italy). A set of Hydrological Indicators (HIs) were used to characterize and classify the flow regime. High-resolution data of streamflow and SS Concentration (SSC) were used for analysing flood events.

In the Búger River, the specific SS yield (SSY: 0.5-46 t km-2 y-1) and maximum SSC were correlated with the runoff, peak discharge, and antecedent rainfall events. In the Carapelle River, SSY and SSCmax were correlated to rainfall intensity. The basin size played an important role in the hysteretic behaviour, which is related to the spatial gradient of rainfall and sediment sources distribution. The Búger River showed predominant clockwise loops indicating SS sources close to the outlet. The Carapelle River showed clockwise and counter-clockwise loops since the large agricultural area promoted a huge sediment availability. Lithology and geological characteristics resulted in the most relevant drivers controlling the hydrological regime and river type classification, meanwhile, rainfall was a less relevant factor. Land use and management practices were also relevant drivers of SSY, determining the availability of suspended sediment material. At the event scale, a non-linearity in the rainfall-runoff relationship was found for both basins, where runoff response can be due to different processes and runoff generation was both for saturation and infiltration excess.