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Fine particles represent an important fraction of the mass of sediment transported by rivers [5]. Suspended load is therefore a significant contributor to the erosion of landscapes. Fine particles are often considered to travel through streams and rivers with minimal interaction. Yet, recent field campaigns demonstrate that fine particles interact with the bed through erosion and deposition [3]. Based on this observation, we develop a simplified model of suspended transport that accounts explicitly for the exchange of small particles between the river bed and the water column. This model involves three parameters: (1) a threshold water level above which the flow starts eroding fine particles from the bed, (2) an erosion rate that characterizes the intensity of sediment entrainment, and (3) a characteristic settling time accounting for sediment deposition.

We then test the validity of the model against data collected in the Capesterre catchment, a small catchment (16.6 km^2) monitored by the Observatory of Water and Erosion in the Antilles (ObsErA). Located in Basse-Terre Island (Guadeloupe archipelago, lesser Antilles arc), this catchment is regularly exposed to floods induced by hurricanes and tropical storms [1][2]. The discharge and the turbidity of the river are measured with a time step of 5 minutes. Using in-situ calibrations, we convert the turbidity signal into a suspended load concentration. The resulting data reveal that the transport of fine sediment is highly intermittent: the concentration of suspended particles C_{SL} rises abruptly when the river height exceeds a threshold of the order of 25 cm, corresponding to a discharge of 5 m3/s. The concentration decrease following the flood peak is more gentle. The resulting concentration-discharge curve takes the form of a counter-clockwise hysteretic loop, as commonly observed in many streams[4].

Using inversion methods, we calibrate the parameters of the model on a few isolated floods. The resulting model consistently reproduces field data and successfully captures the hysteretic behavior of the concentration-discharge loop. This approach might help to better constrain the temporal variability of sediment transport in small catchment.

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