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High-frequency monitoring of debris-flows and flash floods in the French Alps

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The general aim of the study is to improve the understanding of sediment responses during flash floods and debris flows in small French Alpine torrent catchments (2.3 – 48.7 km^2) by means of high-frequency monitoring of water and sediment fluxes (recording time step of 200 ms. to 5 min.). This study is part of two European research programs (RiskNat-Interreg-Alcotra and Paramount-Interreg-Alpine Space Program).
The contribution presents the research aims and the main characteristics of five study sites equipped in 2010. The material used and the monitoring system will be presented through the example of the Real Torrent observatory (2.3 km^2) located in Southern French Alps. Debris flow monitoring systems are based on a combination of different techniques, involving raingauges, soil vibration measurements with geophones, flow elevations measurements with radar and ultrasonic sensors and high-resolution/frequency imagery acquisition with video cameras. Intensive field surveys are also implemented to capture the morphological responses of headwater's channels and to study channel erosion by debris flows.