



The response of a headwater catchment to spatial rainfall patterns – a case study using a high density network of high temporal resolution rain gauges

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Many efforts in the past were dedicated to understand runoff generation sensitivity to rainfall patterns. It has been showed that significant responses were observed only for events covering a large part of the catchment. These studies however were essentially model-based and very few were conducted in small-scale areas, leaving the small headwater catchments in mountainous areas poorly studied. The recent development of low cost devices to measure rainfall events gives now new opportunities to monitor rainfall events with both a fine spatial and temporal resolution.

A 3-month survey was conducted in the experimental Vallon de Nant catchment (14 square kilometers, 1200 to 3051 m. asl.) in the Vaud Alps of Switzerland. The high density network of low cost drop counting rain gauges setup during one summer season allowed investigating the response of a small-scale headwater catchment to rainfall events with both a high spatial and temporal resolution. We discuss here our framework to analyze the interplay between the spatial rainfall patterns and other dominant catchment organisation patterns. The approach is readily transferable to other case studies and opens new perspectives to understand how similar catchments are with respect to spatial rainfall patterns.