



The hydrological response of a rocky head water basin to convective rainfalls

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A sharp-crested weir is installed at the outlet (altitude 1770 m a.s.l) of a rocky channel incised on the walls of Dimai Peak in the area of Fiammes (Cortina d'Ampezzo, Dolomites-North Eastern Italian Alps) at the purpose of measuring runoff discharges. The area of the headwater basin is just 0.032 km² but sub-vertical cliffs are capable to generate notable discharge during severe rainstorms. Due to the severe environment only five runoff events were measured (two times the facility was destroyed by rock falls and avalanches; other times failure of sensors stopped the measurements). Hydrological response is characterized by peaked hydrographs with very high rising limb. A kinematic distributed hydrological model was used to simulate the response of the basin to the convective rainfalls with the help of two rain gauges placed upstream the basin head and downstream the outlet respectively. The hydrological model uses an hortonian simplified law for determining excess rainfall and satisfactorily simulates the measured hydrographs. Such measurements are important for the understanding the hydrological response of a rocky basin to a convective rainfall. Their modeling are important as well when focused on predicting both flash floods in mountain torrents and the triggering conditions and magnitude of runoff generated debris flows.