



Hydrograph separation during artificial rain-on-snow event using deuterium

Roman Juras (1,2), Jirka Pavlasek (2), and Sebastian Würzer (1)

(1) WSL Institute for Snow and Avalanche Research SLF, Davos, Switzerland (juras@fzp.czu.cz), (2) Faculty of Environmental Sciences, Czech University of Life Sciences Prague, Prague Czech Republic

Accurate forecasts of rain-on-snow (ROS) events are vitally important for flood forecasting. Rain water can be partially held in the snowpack or it can accentuate melt. This behaviour is crucial to flood forecasting. Hydrograph separation during rain-on-snow events using deuterium to partition outflow into snowmelt and rain contributions helps to further our understanding of the mechanisms controlling ROS runoff.

In this contribution we will present research from rain-on-snow simulations. The study will be held in the Swiss Alps in Davos and surroundings. Experiments were designed to estimate the retention capacity of the snowpack and time-lag from rain-onset to outflow response. Water enriched with deuterium was used to identify pre-event (non-rain) water and event rain water in the outflow hydrograph. The main objectives are: 1) how the snowpack affects rain water input to the top of the soil during ROS events, 2) what portion of event rain water contributes to the outflow and 3) how do snowpack characteristics change during ROS events?