Geophysical Research Abstracts
Vol. 19, EGU2017-13395, 2017
EGU General Assembly 2017

Realism versus simplicity in the snow routine of the HBV model

Marc Girons Lopez, Marc Vis, and Jan Seibert
Department of Geography, University of Zurich, Zurich, Switzerland

The HBV model still enjoys great popularity, in part because of its simplicity. Depicting the hydrological processes in a catchment in a simple way reduces data requirements and minimises parameter uncertainty. However, the representation of some processes might benefit from an increased model complexity. This is, for instance, the case of snow routine in the HBV-light version of the HBV model. HBV-light uses a degree-day method with a single threshold parameter to distinguish between rain and snow and simulate snow melt. Recent research has shown that hydrological models with a more realistic representation of snow processes might be more successful in estimating runoff.
In this study we explore and test different improvements to the HBV-light snow routine design by considering different threshold temperature values for rain and snow distinction as well as for the beginning of snow melt, and introducing gradual transitions instead of the current sharp threshold. The use of radiation data, which recently became available as gridded data product in Switzerland, is an additional possibility. These modifications would allow for a more realistic depiction of important hydrological processes in alpine and other snow-covered areas while preserving the characteristic simplicity of HBV. Furthermore, in this contribution we evaluate the balance between introducing more realism into the snow routine of the HBV model and keeping the number of parameters as low as possible.