



Experimental basin for identification of snow and ice melt processes

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With the ongoing discussions of climate change impact to the snow melt processes and the depletion of the glaciers in the Alpine environment local process studies and field observations are of growing importance. Since more than ten years the ZAMG carries out snow balance measurements in the Goldbergkees glacier at the southern slopes of the Sonnblick peak. Snow profiling, including snow density and snow temperature measurements, is usually done once in spring period. At some reference plots snow and ice depletion is observed during the entire period.

Since the summer 2002 a runoff gauge for continuous observations of the water level at the meltwater brook was installed. The contributing basin size of the gauge is about 2.5 km², the elevation ranges from 2400 m a. sl. up to 3106 m a. sl.. The latter represents the peak of the Sonnblick, where the meteorological observatory is located. Runoff measurements by means of velocimeters and salt dilution method enabled the creation of a rating curve function for direct transformation of water level observations into discharge data. The observed runoff exhibits a wide temporal variability of discharge in annual but also diurnal frequency.

The aim of the observation program is to relate the runoff observations to different snowmelt models. The special emphasis is on the test of simple models, which can also be applied for ungauged catchments with limited availability of meteorological data. Therefore the first attempts are based on temperature index methods considering elevation zoning and daily air temperature amplitudes. The presentation at the conference will focus on the requirements for runoff gauging facilities in alpine environments related to resistance against storms, maintenance effort and data transfer.

One issue is also the identification of mixed melting processes. As the catchment is – due to its elevation distribution – partly covered with snow and partly with ice, the parameterization of the model has to be done dynamically, based on the state and areal distribution of the snow cover.