



Determination of the distribution of snow cover in heterogeneous terrain

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Detailed information of the temporal and spatial evolution of snow cover in alpine regions is only obtainable from sophisticated physical modelling of accumulation and ablation processes. The validation of the model results requires local data records with a high temporal resolution on a daily or even shorter time scale, depending on the results to be achieved. These models need an appropriate regionalisation of climatological and hydrological input data. For the investigations presented here, this task is fulfilled by one of the groups of the GLOWA Danube research cluster. The data, delivered from the group 'Atmosphere', comprise – among others - air temperature, air humidity, wind velocity and direction and incoming radiation near the surface on a 1 km², 1 hour basis. In the model approach, accumulation processes are mainly controlled by precipitation amounts and air temperature (influencing above all the type of precipitation), ablation is dominated by the terms of the surface energy balance. Special emphasis is laid on the mass changes due to evaporation and condensation. The resulting product is the water equivalent of snow in the mentioned temporal and spatial resolution.

Two parameters - surface temperature and albedo – influence practically all balance terms. As they are not typically available as measured quantities, they have to be determined internally. In this contribution, the modelling approach of the GLOWA-Danube with respect to these points is demonstrated, several means of local validation are presented and the results are discussed for a period of five years in the mountainous part of the upper Danube basin.