



Snow melt modelling and comparison with satellite images

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In the frame of a research project on the *transformation of snow and ice melt processes to ungauged basins*, funded by the Austrian academy of sciences, snow accumulation and snowmelt models were applied for different spatial scales. The areas of the test basins range from 3 km² to approximately 600 km². For the verification of the snow depletion behaviour of the latter basin remote sensing images from the Landsat were compared to the simulation results.

The model discretisation is based on irregular hydrological similar units (HSU). For comparison purposes these patterns were transformed to a regular grid network corresponding with the Landsat resolution. The melt processes including snow and glacier melt were computed by mixed temperature and radiation index models.

In total seven Landsat images of the melting periods were applied for calibration (June 2000, June 2002 and July 2002) and validation (March 2002, August 2003 and September 2004). For the calibration period the melt processes in the high elevated areas were simulated reliably. The satellite images provided reasonable information on the natural snow cover patterns. The simulation model slightly underestimated the snow covered area. With respect to the snow line the model error was about 100 meter.

For the validation period an image for March existed, where the basin could be expected to be entirely snow covered. But the Landsat images exhibited bare zones in mid elevated areas, which corresponded with the forested areas of the basin. This deviation of the satellite images from the expected ground truth snow cover lead to misinterpretation of the model results. In this case the satellite image could not prop-

erly be used for model verification. But for the summer period the validation showed comparable results with the calibration.