Geophysical Research Abstracts
Vol. 13, EGU2011-1647, 2011
EGU General Assembly 2011
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New radiation initiatives in Austria: Part II (Modeling)

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We present first steps in the development of an operational solar radiation model for the national territory of Austria. The project STRAHLGRID aims to calculate solar irradiance values (direct and diffuse part) on a 1x1 km grid for daily totals in near real time. Two existing models will be used to calculate solar radiation: the snow cover model AMUNDSEN and the open source GIS module r.sun. To reproduce real values at best, we use precipitable water and a cloud raster from the ZAMG operational nowcasting model INCA at same spatial resolution. The cloud raster combines measured sunshine fraction at 249 automatic weather stations (TAWES) with cloud type from Meteosat second generation and is therefore directly relevant for solar radiation. It is updated every 15 minutes. To account for multiple reflections, the ground albedo is taken from the snow cover of AMUNDSEN and MODIS imagery, respectively, depending on the model applied. To validate the model, global solar radiation and sunshine duration data measured both at 232 automatic weather stations in Austria will be used. All measurements are quality controlled in the framework of the monitoring program ARAD at ZAMG (see separate Poster Olefs et al. Part I).