Use of integrated profiling techniques for testing radiative transfer schemes

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The combination of multiple wavelength active and passive remote sensing instruments offers the unique opportunity to derive the atmospheric state as complete as possible. In particular, the Integrated Profiling Technique (IPT, L"ohnert et al., 2004; 2006) has been successfully applied to derive profiles of temperature, humidity and liquid water by a Bayesan based combination of groundbased microwaver radiometer, cloud radar, ceilometer and a priori information. This method is currently extended to further derive the ice water content as well as effective radii for both liquid and solid clouds.

We want to exploit the longterm continuous measurements of the ARM Mobile Facility in the Black Forest in conjunction with our multispectral microwave radiometers from April 1 to December 31, 2007 to apply the IPT in near realtime. The IPT results which include error estimates of the different variables offer the possibilty of testing the radiative transfer scheme of atmospheric models. For that purpose single columm versions of atmospheric models can be fed with the IPT output to derive surface radiative fluxes (shortwave and infrared). Though 3D effects will lead to some discrepancies between calculated and AMF obserfed fluxes statistical comparisons and auxillary information (e.g. aerosol measurements) will allow an assesment of the models radiative schemes. As a first step we will focus on the scheme of the German Weather Services Lokal-Modell (LM) which is also used within the regional climate model (CLM).