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# Influence of an Improved Soil Scheme on the Arctic Climate

**S. K. Saha**, A. Rinke, K. Dethloff

Alfred Wegener Institute for Polar and Marine Research (ssaha@awi-potsdam.de/Fax-Nr. +49-3312882178)

The regional climate model HIRHAM has been simulated over 15 years (1979-1993) for the pan-Arctic domain whereby two different soil schemes (ECHAM4, Roeckner et al., 1996; LSM, Bonan et al., 1996a) have been coupled with the atmosphere. The performance of both model versions has been evaluated by comparing different atmospheric variables (air temperature, precipitation) and selected soil variables (ground temperature profile, snow depth and season) with observations from different Russian sites. For the ground temperature, the model shows realistic temperature damping profile as well as interannual variability. Complex soil scheme of LSM is able to improve the soil and surface temperature simulations. However, the model winter soil temperature was colder and this bias is less pronounced in the western Russia than in the far-East Siberia.

Use of two land surface schemes has introduced changes in the atmospheric variables ( such as 2m air temperature, mean sea level pressure) not only over land part, but also in the remote areas of the Arctic Ocean. This indicates that the impact of land surface changes in the Arctic are not local in nature but it can be felt in the remote areas also.

IPCC B2 scenario simulation has been performed with both model versions. The future projections of 2m air and soil temperature by these two model versions differ from each other. Our study shows that the use of different land surface scheme or an improvement itself can introduce uncertainty in the future Arctic air and soil temperature projection by about 2 degree Celsius.