



Coupled Single-Column Model Framework for Polar Processes

Kerstin Hartung (1), Gunilla Svensson (2), and Hamish Struthers (3)

(1) Department of Geography, LMU Munich, Munich, Germany, (2) Department of Meteorology, Stockholm University, Stockholm, Sweden, (3) NSC, Linköping, Sweden

The polar regions are known for several complex small-scale processes that need to be parameterised in models, such as the formation of clouds, boundary layer mixing in ocean and atmosphere, sea ice formation/melt and the surface energy exchanges. These processes are also involved in substantial feedback mechanisms in the climate system. Numerical models, both for weather forecasts and climate applications, have been shown to have large biases in polar regions that may originate from these parameterised processes. An innovative single-column model framework has been developed. It builds on the more commonly used atmosphere-only and ocean-only frameworks and extends to capture the entire system from ocean bottom, through the sea ice and snow, to the top-of-atmosphere. The framework will be explained in the presentation and physical and numerical sensitivity experiments on a summer moist-intrusion event will be provided in comparison to observational data.