B07-O13

INFLUENCE OF SURFACE FLUXES ON POLAR LOW DEVELOPMENT: IDEALISED SIMULATIONS

Annick Terpstra *(University of Bergen, Norway)*
Linda Green *(University of Bergen, Norway)*
Thomas Spengler *(University of Bergen, Norway)*

annick.terpstra@gfi.uib.no

Polar lows develop during marine cold air outbreaks in regions with relative large sea surface temperature (SST) gradients favourable for large surface sensible and latent heat fluxes. Furthermore, the differential heating can provide a source for baroclinicity. We utilize an idealized channel model to gain insight in the role of surface fluxes on the dynamical evolution of polar lows. The initial setup consists of a baroclinic jet in thermal wind balance. To mimic cold air outbreaks we introduce an SST distribution which is warmer than the low level surface air temperature, where the SST has a meridional gradient similar to the SST gradient in the Nordic Seas during winter. This setup allows for a systematic investigation of the relative contributions from surface sensible and latent heat fluxes on polar low development by varying the intensity of the initial baroclinicity, moisture, and SSTs. In addition, we performed all simulations with either sensible of latent heat fluxes switched off. The simulations are evaluated in terms of structural evolution and the relative importance of the generation of eddy available potential energy via diabatic versus baroclinic processes, where the diabatic contributions are separated into different parameterized subgrid-scale procesesses such as latent heating from cumulus convection or micro-physical processes as well as surface fluxes.