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# Evaluation of PBL schemes in WRF for high Arctic conditions

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We examined the features of the Arctic boundary layer during winter (land and sea covered by snow/ice) and summer (sea covered by sea ice) using Weather Research and Forecasting (WRF) model version 3.4.1 and radiosounding data collected at Station Nord (81.65N, 16.65W) . The dataset consist of about 30 soundings (March 3 -18, 2012) and 25 soundings for summer period (July 25 – August 05, 2011). The US NCEP Final Analyses (FNL) with 1x1 degree spatial and 6 hours temporal resolution was used to initialize the model. Sensitivity of model performance to vertical and spatial resolution was examined through two configurations (25 vertical levels and 4km grid step, 42 vertical levels and 1.33 km grid step). WRF was run with two planetary boundary layer schemes: Mellor –Yamada – Janjic with local vertical closure and non – local Yonsei University scheme. Temporal evolution of planetary boundary development in the summer period was documented by up to 4 sounding per day (00, 06, 12, 18 GMT) and with MYJ scheme it was resolved with correlation coefficient above 0.7 (except for the zonal component of the wind). The variability of the correlation coefficient with height showed good agreement above 80 m for temperature, above 150 m for relative humidity and for all levels for wind speed. Direct comparison of model and measured data showed that vertical profiles of studied parameters were reconstructed by the model relatively better in cloudy sky conditions, compared to clear skies.