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Comparison of retrieved temperature profiles from AMSU and radiosonde data in polar regions

N. Mathew, G. Heygster

Institute of Environmental Physics, University of Bremen, D-28334, Bremen, Germany
(mathew@iup.physik.uni-bremen.de)

Polar regions play an important role in global variability and change. Knowledge of the temperature profile of the atmosphere is vital in climatological and meteorological studies and numerical weather prediction. Data from AMSU (Advanced Microwave Sounding Unit) radiometers on new generation satellites of the National Oceanic and Atmosphere Administration (NOAA) are well suited for the retrieval of temperature profiles. However, the retrieval of near surface profiles in polar regions is restricted due to the high and highly variable surface emissivity. Polar temperature profiles are retrieved using a radiative transfer algorithm and the results are compared with collocated radiosonde observations. The retrieval errors are quantified. The sensitivity to errors in prescribed emissivity, sea ice concentration and the surface type identification in the algorithm for the temperature retrieval in the near surface part is analysed.