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Microwave measurements of temperature profiles, integrated water vapour, and liquid water path at Thule Air Base, Greenland.

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A RPG Humidity And Temperature PROfiler (HATPRO-G2) radiometer was installed at Thule Air Base (76.5° N, 68.8° W), Greenland, in June 2016 in the framework of the Study of the water VApour in the polar AtmosPhere (SVAAP) project.
The Danish Meteorological Institute started measurements of atmospheric properties at Thule Air Base in early '90s. The Thule High Arctic Atmospheric Observatory (THAAO) has grown in size and observing capabilities during the last three decades through the international effort of United States (NCAR and University of Alaska Fairbanks) and Italian (ENEA, INGV, University of Roma and Firenze) institutions (http://www.thuleatmos-it.it).
Within this context, the intensive field campaign of the SVAAP project was aimed at the investigation of the surface radiation budget and took place from 5 to 28 July, 2016.
After the summer campaign the HATPRO has continued to operate in order to monitor the annual variability of the temperature profile and integrated water vapour as well as the presence and characteristics of liquid clouds in the Artic environment.
The combined use of the HATPRO together with other automatic instruments, such as a new microwave spectrometer (the water Vapour Emission Spectrometer for Polar Atmosphere VESPA-22), upward- and downward-looking pyranometers and pyrgeometers, a zenith-looking pyrometer operating in the 9.6-11.5 μm spectral range, an all sky camera, and a meteorological station, allows to investigate the clouds' physical and optical properties, as well as their impact on the surface radiation budget.
This study will present and discuss the first few months of HATPRO observations; the effectiveness of the statistical retrieval used to derive the physical parameters from the HATPRO brightness temperatures will also be investigated through the comparison of the temperature and humidity profiles, and integrated water vapour, with data from radiosondes launched during the summer campaign and in winter time.