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Results of field experiment using a self-calibrating, ground-based multichannel radiometer and model data for the retrieval of water vapor and temperature profiles

M. Schröder (1), G. Ilin (2), S. G. Smolencev (2), A. V. Troitsky (3), E. A. Miller (4), and E. V. Ganshin (4)

(1) IfU GmbH Privates Institut für Umweltanalysen, Gottfried-Schenker-Str. 18, 09244 Lichtenau, Germany (phone +49 (37208) 88912, phone +49 (37208) 88929), (2) Federal State Budget Institution "Institute of Applied Astronomy of Russian Academy of Sciences" (FSBI "IAA RAS"), Russian Federation, (3) The Radiophysical Research Institute (NIRFI), 25/12a B.Pecherskaya st, Nizhny Novgorod, 603950, Russian Federation phone +7 (831) 436-72-94, fax +7(831) 436-99-02, (4) Research-and-production organization "Atmospheric Technologies" Limited (R.P.O. ATTEX Ltd.) (rpo.attex@gmail.com)

During the 2017-2018 winter season, the new ground-based multichannel microwave complex has been tested to improve the abilities in retrieval of the temperature and humidity profiles up to 10 km height. This radiometric complex for remote sensing of troposphere meteorological parameters consists of three microwave radiometric receivers operating at the frequencies: 20.7, 31.4 and 56,7 GHz. Three receivers are combined in one device – classic water vapor radiometer (WVR) designed by the Institute of Applied Astronomy (RAS, www.aoipaspb.com) and an additional temperature profiler channel (RPO ATTEX, www.attex.net).
The main advantages of this system are: temperature profile, water vapor content, liquid water content, humidity profile, self-calibration and all-weather conditions unmanned operation. For retrieval procedures, data from direct measurements and numerical model data is used. The presentation shows the intercomparisons results of temperature and humidity profiles retrieval. The multichannel radiometers measurements of water vapor and temperature profiles techniques were compared with radiosounding data.