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Validation and statistical analysis of temperature, humidity profiles and Integrated Water Vapor (IWV) from microwave measurements over Granada (Spain)

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Profiles of meteorological variables such as temperature, relative humidity and integrated water vapor derived from a ground-based microwave radiometer (MWR, RPG-HATPRO) are continuously monitored since 2012 at Granada station (Southeastern Spain). During this period up to 210 collocated meteorological balloons, equipped with a radiosonde DFM-09 (GRAWMET), were launched. This study is carried out with a twofold goal. On one hand, a validation of the MWR products such as temperature and water vapor mixing ratio profiles and the IWV from MWR is carried out comparing with radiosonde measurements. The behavior of MWR retrievals under clear and cloudy conditions and for special situations such as inversions has been analyzed. On the other hand, the whole period with continuous measurements is used for a statistical evaluation of the meteorological variables derived from MWR in order to thermodynamically characterize the atmosphere over Granada.