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APPLICATION OF REMOTE SENSING TECHNIQUES TO STUDY AEROSOL WATER VAPOUR UPTAKE IN A REAL ATMOSPHERE

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Abstract

In this work, a study of several observations of aerosol water uptake in a real (non-controlled) atmosphere, registered by remote sensing techniques, are presented. In particular, three events were identified within the Atmospheric Boundary Layer (ABL) and other two events were detected in the free troposphere (beyond the top of the ABL). Then, aerosol optical properties were measured at different relative humidity (RH) conditions by means of a multi-wavelength (MW) Raman lidar located at CIEMAT (Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas, Research Centre for Energy, Environment and Technology) facilities in Madrid (Spain). Additionally, aerosol optical and microphysical properties provided by automatic sun and sky scanning spectral radiometers (CIMEL CE-318) and a meteorological analysis complement the study. However, a detailed analysis only could be carried out for the cases observed within the ABL since well-mixed atmospheric layers are required to properly characterize these processes. This characterization of aerosol water uptake is based on the curve described by the backscatter coefficient at 532 nm as a function of RH which allows deriving the enhancement factor. Thus, the Hänel parameterization is utilized, and the results obtained are in