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Instrumentation inter-comparison and atmospheric boundary layer height retrievals during SLOPE II campaign at Granada (Spain)

Juan Luis Guerrero-Rascado (1,2), Maria Joao Costa (3), Alberto Cazorla (1,2), Miguel Potes (3), Andrés Esteban Bedoya (1,2), Daniele Bortoli (3), Pablo Ortiz-Amezcua (1,2), Juan Antonio Benavent-Oltra (1,2), Roberto Román (1,2), Lucas Alados-Arboledas (1,2)

(1) Andalusian Institute for Earth System Research (IISTA-CEAMA), Granada, Spain, (2) Dpt. Applied Physics, Faculty of Sciences, University of Granada, Granada, Spain, (3) Dpt. Physics and Institute of Earth Sciences (ICT), University of Évora, Évora, Portugal

TOPROF COST Action aims to coordinate the operation of the ceilometers, Doppler lidars and microwave radiometers across Europe, in order to be networked and provide quality controlled observations of several atmospheric variables in near real time. One of the tasks of Working Group 1 deals with boundary layer retrievals aiming at deriving improved atmospheric boundary (ABL) height retrievals from large automatic lidar ceilometer networks, as well as to advance in aerosol tracer understanding through combined analyses with different instruments as Microwave Radiometers (MWR) and Doppler lidars (DL).
The SLOPE II campaign (Sierra Nevada Lidar AerOsol Profiling Experiment II) was organized in the framework of ACTRIS2 with the aim of gathering data useful for testing the retrieval schemes to be applied for 24-hour absorption coefficient profiling through inversion of remote sensing observations. The campaign combines active/passive remote sensing of the vertical column with in-situ measurements at several levels in Sierra Nevada. In late spring 2017 several instruments from the University of Évora will be temporarily moved to Granada site in order to participate in the SLOPE II campaign. A RPG G4 MWR and a CL31 ceilometer integrate the set of instruments to be deployed at Granada during a short period of about a week. At the same site there are comparable instruments comprising a RPG G2 MWR, as well as a Jenoptik CHM 15k Nimbus ceilometers and a Doppler lidar. During the same period several GRAW radiosondes will be launched. The LN2 MWR calibration will be performed in the beginning of the campaign for both instruments.
The aim of the work is twofold: on one hand to present an inter-comparison between both MWRs and ceilometers, between the MWR derived thermodynamic profiles and the corresponding radiosounding profiles and between the DL wind profiles and the corresponding radiosounding profiles; on the other hand to retrieve ABL height from the ceilometers and MWRs and compare these values with the results obtained from the radiosonde profiles.

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