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Planetary boundary layer of the urban area of Rome: High resolution model simulation (WRF) and satellite and ground based observations.

E. Pichelli, R. Ferretti, and the Pichelli Emanuela Team

Dept. Physics, Univ. of L'Aquila/CETEMPS, L'Aquila, Italy (emanuela.pichelli@aquila.infn.it)

A planetary boundary layer (PBL) study is performed with the aim of better understanding the leading factors on dynamics in urban areas, since urbanization significantly affects local thermo dynamical conditions and PBL evolution.
The new generation model WRF has been used to reproduce the circulation in the urban area of Rome. The ability of the model to simulate the characteristics of the urban PBL is tested by comparing model results with observations coming from several instrumentations such as LIDAR, SODAR, sonic anemometers, soundings and satellite measurements. A further comparison is performed with the mesoscale model MM5 .
A sensitivity study is performed using different PBL parameterizations for wind, temperature, turbulent fluxes, PBL height, water vapor mixing ratio and integrated content with the aim of tuning the parameterization for the urban area of Rome. Particular attention has been focused on model water vapor field both for its strong impact on dynamics and for its usefulness as support in satellite phase delay signal investigation such as in InSAR case.
The study has been performed using different events of the typical meteorological scenarios of the urban area: the Aniene event and a Metawave campaign event.