Name and affiliation of the author(s):
HristinaKirova[1], Ekaterina Batchvarova[2],Reneta Dimitrova[3], Evgeni Vladimirov[3,4]
[1]National Institute of Meteorology and Hydrology
[2]Climate, Atmosphere and Water Research Institute-Bulgarian Academy of Sciences
[3]Sofia University "St. KlimentOhridski"
[4]BULATSA
Email of the author(s):
hristina.kirova@meteo.bg
Ekaterina.Batchvarova@cu.bas.bg
r.dimitrova@phys.uni-sofia.bg
evgeniv@uni-sofia.bg
Presenting author:
Ekaterina Batchvarova
Abstract title:
Validation of WRF model over urban area in comlex terrain
Abstract text (max 300 words):
The urban convective atmospheric boundary layer (ABL) structure and its evolution are studied using the Weather Research and Forecasting (WRF) model for the period of Sofia Experiment 2003. Two new datasets have been implemented and adapted in this study: SRTM 1-arc-second digital elevation data (SRTM, NASA) and the more recent CORINE 2012 with 3-arc-second resolution Land Cover data (CLC2012, EEA) for Europe. The experimental data, that have been used for model validation,include: turbulent fluxes (at every 30 min) and radiosounding measurements of temperature, humidity wind speed and direction on every 2 h during the day time. Data from METEK ultrasonic anemometers and a KH20 fast hydrometer at 20 m and 40 m height above the ground are compared with the model outputs. The spatial distribution of simulated maximal values of sensible (HFX) and latent (LH) heat fluxes clearly indicatethe location of big green areas in Sofia city, water bodies and mountain ridges, due to implementation of new detailed CORINE land use in WRF.The modelis able to reproduce adequately the HFX for the entire period,with exception of September 30th, when 2.6 mm rain was recorded. Simulated HFX is about 2 times larger than measured, but WRF is able to capture the sharp jump in LH after the rainfall. The simulated maximal values of friction velocity are overestimated in comparison with observations. Vertical cross sections of simulatedand measured potential temperature, humidity, mixing ratio, wind speed and direction (up to 8000 m) show strong correlation ($0.8<r<1$). The 5-days averaged simulated and measured potential temperature profiles are in general agreement, including the ABL height and transition times between stable and unstable conditions.