Geophysical Research Abstracts
Vol. 21, EGU2019-17708, 2019
EGU General Assembly 2019

Evaluation of WRF and HARMONIE models simulating a period with radiation and cloud-base-lowering fog events

Carlos Yagüe (1), Carlos Román-Cascón (1,2,3), Gert-Jan Steeneveld (4), Gema Morales (5), Jon A. Arrillaga (1), Mariano Sastre (1), and Gregorio Maqueda (1)

(1) Dept. Física de la Tierra y Astrofísica. Universidad Complutense de Madrid (UCM), Madrid, Spain (carlos@ucm.es), (2) Laboratoire d'Aérologie, Université Toulouse Paul Sabatier, CNRS, France (carlosromancascon@ucm.es), (3) Centre Nationale d'Études Spatiales, CNES, France, (4) Meteorology and Air Quality Section. Wageningen University, The Netherlands (gert-jan.steeneveld@wur.nl), (5) Spanish Meteorological Agency (AEMET), Madrid, Spain (gmoralesm@aemet.es)

It is well-known that numerical weather prediction models still have problems simulating some types of fog under certain conditions. In part, this is due to the possible influences of several interrelated processes that affect the formation, evolution and dissipation of fog. Identifying the models' weaknesses is crucial to develop improved models for fog forecasting. In this work, we evaluate the skill of two mesoscale models (WRF and HARMONIE configured similarly) simulating a period with several consecutive radiation and cloud-base-lowering (CBL) fog events at the Research Centre for the Lower Atmosphere (CIBA) in the Northern Spanish Plateau in Spain. The formation mechanism and the characteristics of these two type of fog are different. Therefore, the skill of the models for their simulation can also be different. Our evaluation illustrates how the two models presented more difficulties for the simulation of shallow radiation fog than for deeper CBL fog. It is shown how these periods with alternating radiation and CBL fog are especially complicated for the models due to the interaction between both types of fog. Thus, models usually overestimate the duration and thickness of CBL fog, which influences the simulation of radiation fog formed the next night due to impacts on the radiative cooling close to the surface.