Geophysical Research Abstracts
Vol. 16, EGU2014-1629-1, 2014
EGU General Assembly 2014

An intercomparison of mesoscale simulations during the Boundary Layer Late Afternoon and Sunset Turbulence (BLLAST) experimental field campaign

Maria A. Jimenez (1), Wayne M. Angevine (2), Eric Bazile (3), Fleur Couvreux (3), Joan Cuxart (4), David Pino (5), and Mariano Sastre (6)

(1) Department of Global Change Research, IMEDEA (CSIC-UIB), Institut Mediterrani d'Estudis Avançats, Esporles, Spain, (2) Chemical Sciences Division, Earth System Research Laboratory, NOAA, Boulder, USA, (3) CNRM/GMAP, Meteo France, Toulouse, France, (4) Department of physics, Universitat de les Illes Balears, Palma de Mallorca, Spain, (5) Department of Applied Physics, Universitat Politècnica de Catalunya, Barcelona, Spain, (6) Departamento de Geofísica y Meteorología, Universidad Complutense de Madrid, Madrid, Spain

The Convective (diurnal, CBL) and Stably stratified (nocturnal, SBL) Boundary Layers over land have been extensively observed and relatively successfully modeled. But the early morning transition, when the CBL emerges from the nocturnal boundary layer, and the late afternoon transition, when the CBL decays to an intermittently turbulent residual layer overlying a SBL, are difficult to observe and model due to the intermittency and anisotropy of turbulence, horizontal heterogeneity and rapid changes in time.

The Boundary Layer Late Afternoon and Sunset Turbulence (BLLAST) experimental field campaign took place in Lannemezan, a plateau located at the foothills of the Pyrenees, during June and July 2011. The aim of this project is to have more and better observations of the late afternoon and morning transitions and to further explore the mechanisms that control it.

In this work, different mesoscale models (WRF, MesoNH, AROME, ARPEGE) are run under the same conditions during 24 hours (from 0000 UTC 25th June 2011 to the next day) to evaluate their performance during both transitions. Particular effort has been made to analyze the surface conditions. For this reason, the WRF simulations include a novel technique to spin-up soil conditions to obtain a better representation of surface fluxes. The model outputs are compared to the observations (soundings, UAV, radar and surface stations). It is found that the results depend on the initial conditions but also on the parameterizations of the boundary layer and the surface.