Geophysical Research Abstracts
Vol. 16, EGU2014-15457, 2014
EGU General Assembly 2014

The Boundary Layer Late Afternoon and Sunset Turbulence Project

Marie Lothon (1), Fabienne Lohou (1), Clara Darbieu (1), Fleur Couvreux (2), David Pino (3), Estel Blay (3), Jordi Vila-Guerau de Arellano (4), Henk Pietersen (4), Oscar Hartogensis (4), Eric Pardyjak (5), Daniel Alexander (5), Joachim Reuder (6), Line Baaserud (6), Erik Nilsson (1), Maria Antonia Jimenez (7), Ian Faloona (8), Mariano Sastre-Marugan (9), Wayne M. Angevine (10), Guylaine Canut (2), Eric Bazile (2), and the the rest of the BLLAST Team

(1) Laboratoire d'Aérologie, University of Toulouse, CNRS, France, (2) CNRM-GAME (Météo-France and CNRS), Toulouse, France, (3) Applied Physics Department, Barcelona Tech UPC, Castelldefels, Spain, (4) Meteorology and Air Quality Section, Wageningen University, Wageningen, The Netherlands, (5) University of Utah, Salt Lake City, Utah, USA, (6) Geophysical Institute, University of Bergen, Bergen, Norway, (7) Department of Global Change Research, IMEDEA (CSIC-UIB), Institut Mediterrani d'Estudis Avançats, Esporles, Spain, (8) Land, Air and Water Resources, UC Davis, Davis, CA, (9) Dpt. Geofísica y Meteorología, Universidad Complutense de Madrid, Facultad Ciencias Físicas, Madrid, Spain, (10) CIRES, University of Colorado, and NOAA ESRL, Boulder, Colorado, USA, (11) Laboratoire de Physique et Chimie Atmosphériques, Université du Littoral Côte d'Opale, Dunkerque, France, (12) University of Braünschweig, (13) Institute of Biometeorology - National Research Council (IBIMET-CNR), Florence, Italy

The BLLAST (Boundary Layer Late Afternoon and Sunset Turbulence) project aims at better understanding the turbulence processes which occur during the transition from a well-mixed convective boundary layer to a residual layer overlying a stabilized nocturnal layer. This phase of the diurnal cycle is challenging from both modeling and observational perspectives: it is transitory, most of the forcings are small or null during the transition and the turbulence regime changes from the fully convective regime of turbulence, close to homogeneous and isotropic, toward more heterogeneous and intermittent turbulence during its decay.

Those issues motivated a field campaign that was conducted from 14 June to 8 July 2011 in southern France in complex terrain and consisted of a range of integrated instrument platforms including: full-size aircraft, Remotely Piloted Airplane Systems (RPAS), remote sensing instruments, radiosoundings, tethered balloons, surface flux stations, and various meteorological towers deployed over different surface covers. The boundary layer, from the earth's surface to free troposphere was densely probed during the entire day, with a focus and intense observations from midday until sunset.
The field dataset now forms the base of a set of studies utilizing the observations and several types of models including: Large Eddy Simulation, Mesoscale models, forecast models.

The presentation will expose an overview of this experiment and of the current observational and modeling studies, with the focus on: the turbulence decay process within the entire boundary layer from surface to the top, the mesoscale forcings of importance during BLLAST, the ability of the forecast models to represent the diurnal cycle, the relevance of the Monin Obukhov similarity theory, and shallow drainage flows.

Reference:

Lothon M. et al., 2012. The Boundary-Layer Late Afternoon and Sunset Turbulence field experiment, Proc. of the 20th Symposium on Boundary-Layers and Turbulence, 7-13 July, Boston, MA, USA.