



Interactions lake-atmosphere: The ALEX 2014 field campaign and numerical simulations

Salgado, R.(1,2), Potes, M.(1), Albino, A.(1), Apolinário, J.(3), Barbosa, S.(4), Bárias, S. (1), Beliche, P. (5), Bortoli, D.(1), Canhoto, P.(1,2), Costa, M. J.(1,2), Fernandes, R.M.(3,4), Harrison, G.(6), Ilhéu, A.(7), Le Moigne, P.(8), Lima, R.(9), Lopes, F.(4), Lopes, T.(2), Marques, J.(10), Melgão, M.(1,2), Miranda, P. M.(4), Morais, M.(1,2), Murteira, M.(7), Nicoll, K.(6), Novais, M. H.(1), Nunes, S.(2), Parrondo, M. C.(11), Penha, A.(2), Pereira, S.(1), Policarpo, C.(1), Prior, V.(10), Rodrigues, C. M.(2), Rosado, J.(1), Sá, A.(3,12), Serafim, A.(1), Silva, H.(1), Soares, P. M. M.(4), Tlemçani, M.(1,2), Zavattieri, A.(2)

(1) Instituto de Ciências da Terra, Universidade de Évora, rsal@uevora.pt

(2) Escola de Ciências e Tecnologia, Universidade de Évora,

(3) SEGAL, Universidade da Beira Interior

(4) Instituto D. Luís

(5) Comissão de Coordenação e Desenvolvimento Regional, CCDR - Alentejo

(6) Department of Meteorology, University of Reading, UK

(7) Empresa de Desenvolvimento e Infraestruturas de Alqueva, EDIA

(8) CNRM-GAME, Météo-France/CNRS, France

(9) Escola Superior de Tecnologia da Saúde do Porto, Instituto Politécnico do Porto

(10) Instituto Português do Mar e da Atmosfera

(11) Instituto Nacional de Técnica Aeroespacial (INTA), Spain

(12) Instituto Politécnico da Guarda

The ALqueva hydro-meteorological EXperiment, ALEX 2014, was an integrated field campaign with measurements of chemical, physical and biological parameters in water and air at different experimental sites in the region of the Alqueva reservoir, a 250 km² man made lake, in the southeast of Portugal. The Field campaign took place from June 1 to September 30, 2014 and comprises an Intensive Observation Period (IOP) of three days (22 to 24 July).

During the four months, the over water fluxes of momentum, heat and mass (H₂O and CO₂) were obtained with an integrated Open-Path CO₂ /H₂O Gas Analyser and 3D Sonic Anemometer, mounted on a floating platform, where radiative fluxes were also measured, as well as the water temperature profile. Eight near surface weather stations were operating in the area and air quality, atmospheric electrical field (Potential Gradient) and radon (²²²Rn) concentration were continuously monitored. Along this period, in situ measurements, water samples and biological elements were monthly collected from three fixed platforms placed in the lacustrine zone and from selected sites in the margins.

During the IOP, radiosondes were launched every three hours, allowing a characterization of the atmospheric boundary layer and its evolution. In 10 occasions Geigersondes were coupled to the radiosondes in order to obtain the atmospheric ionization profile. The boundary layer was characterized with a Ceilometer and the vertical distribution of O₃ and NO₂ were obtained from a Spectrometer. A GPS network of 15 GNSS stations was installed in order to map the water vapour. The sky brightness

on the nights of July 24 and 25, was measured using a Sky Quality Meter.

The lake-atmosphere interactions and its impact in the boundary layer structure and in the local circulations are studied using data collected during the ALEX 2014 POI together with results from numerical simulations performed with the non-hydrostatic Meso-NH french model.