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Measurements of Lake-Atmosphere interactions at Alqueva reservoir

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The exchanges between lakes and the atmosphere at Alqueva reservoir, Southeast Portugal, are the object of a 2014 Summer experiment described is this work, with special attention to above water, air-water interface and below water measurements. The field campaign take advantage of the floating meteorological stations already established at the Alqueva reservoir. The troposphere and lower stratosphere are characterized by radiosondes with weather balloons through profiles of temperature, pressure, humidity and wind components. Air-water interface momentum, heat and mass (H_2O and CO_2) fluxes are obtained with the new Campbell Scientific's IRGASON Integrated Open-Path CO_2/H_2O Gas Analyser and 3D Sonic Anemometer with a unique design that contains no special displacement between the sample volumes of the gas analyser and the sonic anemometer. The radiative balance, both in short and long wave, is assessed with an albedometer and a pirradiometer. Water surface spectral reflectance is obtained with a portable spectroradiometer in the visible and near-infrared. Water temperature profile is also continuously recorded. In-water solar spectral downwelling radiance/irradiance profiles are measured which enable the computation of the attenuation coefficient of light in the water column. Thus, with detailed information of the Lake-Atmosphere interactions, it is possible to determine the energy and mass balance of the lake.