Geophysical Research Abstracts
Vol. 18, EGU2016-11878, 2016
EGU General Assembly 2016

Vertical profile of fog microphysics : a case study

Frédéric Burnet (1), Pierre-Etienne Brilouet (1), Marie Mazoyer (1), Thierry Bourrianne (1), Jean-Michel Etcheberry (1), Brigitte Gaillard (1), Dominique Legain (1), Diane Tzanos (1), Joel Barrié (1), Sébastien Barrau (1), and Stephan Defoy (2)

(1) METEO-FRANCE/CNRS, CNRM-GAME, Toulouse, France, (2) METEO-FRANCE/CNRS, DIRSO, Bordeaux, France

The occurrence and development of fogs result from the non-linear interaction of competing radiative, thermodynamic, microphysical and dynamical processes and the forecasting of their life cycle still remains a challenging issue.
Several field campaigns have been carried out at the SIRTA observatory in the Paris suburb area (France). These experiments have shown that fog events exhibit large differences of the microphysical properties and various evolutions during their life cycle.
To better understand relationships between the different processes and to validate numerical simulations it is necessary however to document the vertical profile of the fog microphysics.

A CDP (Cloud Droplet Spectrometer) from DMT (Droplet Measurement Technology, Boulder, CO) has been modified to allow measurements of the droplet size distribution in fog layers with a tethered balloon. This instrumental set-up has been used during a field campaign during the winter 2013-214 in the Landes area in the South West of France. To validate the vertical profiles provided by the modified CDP, a mast was equipped with microphysical instruments at 2 altitude levels with an another CDP at 24 m and a Fog Monitor FM100 at 42 m.

The instrumental set-up deployed during this campaign is presented. Data collected during a fog event that occurred during the night of 5-6 March 2014 are analysed. We show that microphysical properties such as droplet number concentration, LWC and mean droplet size, exhibit different time evolution during the fog life cycle depending on the altitude level. Droplet size distribution measurements are also investigated. They reveal sharp variations along the vertical close to the top of the fog layer. In addition it is shown that the shape of the size distributions at the top follows a time evolution typical of a quasi-adiabatic droplet growth.