VERTICAL STRUCTURE OF THE MARINE BOUNDARY LAYER DURING THE LASIE EXPERIMENT IN THE LIGURIAN SEA

Preliminary results

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During the LASIE experiment (Ligurian Sea, 16-22 June 2007) the vertical structure of the Marine Boundary Layer was monitored by a radiosonde system and a ceilometer onboard of N/O URANIA-CNR research vessel. One of the purpose was to compare the height of the MABL from the two systems. Here, we present preliminary results from the two instruments under different meteorological condition with both offshore and onshore flow.

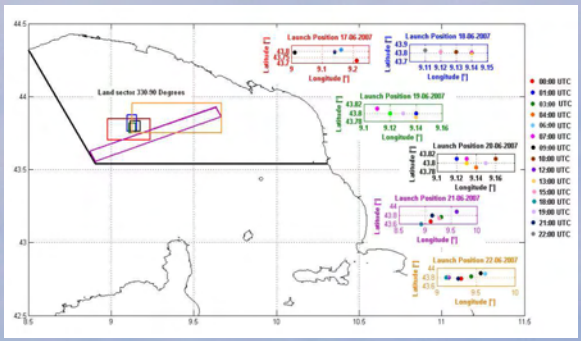

FIGURE 1. Urania operational area during LASIE

Experimental SETUP

Figure 1 shows the operational areas for the 6 days of the campaign in box of different colors. During the first 3 days the Urania was in a small offshore area where is located the meteo-marine buoy ODAS-Italia1, while for last three days the ship was moving go and back to the coast.
Radiosondes (DigiCORA Sounding System MW21) were released every 3 hours while the ceilometer (VaisalaCL31) was continuously measuring. Contemporaneous surface meteorological measurements were collected by sensors mounted onboard and on the buoy ODAS-Italia1.
We have considered a sector of 120 degrees "land" sector characterised by offshore flow from the main land.

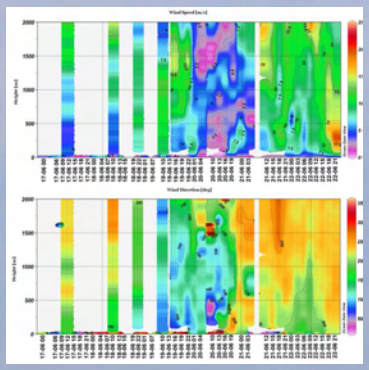

FIGURE 2a. Time evolution of the vertical structure of U (Top) and DIR (Bottom)

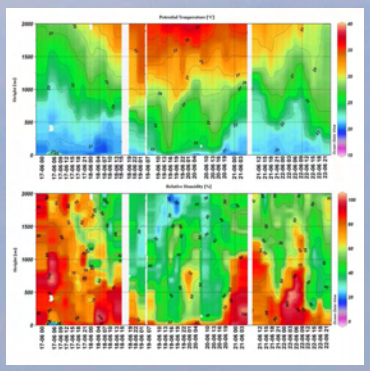

FIGURE 2b. Time evolution of the vertical structure of Θ (Top) and RH (Bottom) during LASIE

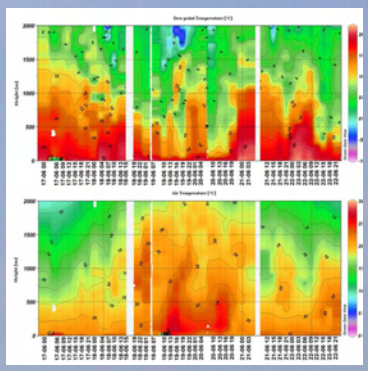

FIGURE 2c. Time evolution of the vertical structure of Td (Top) and air T (Bottom) during LASIE

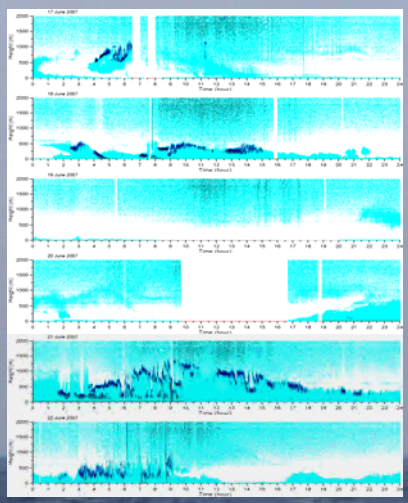

FIGURE 3. Time evolution of the vertical layer structure of the Marine ABL by ceilometer during the 6 days of the experimental campaign.

The LASIE experiment allows us to obtain a seldom database for the Mediterranean area to monitor the evolution of the structure of the MABL during 6 days, with intensive radiosoundings and continuous measurements from a ceilometer combined with surface data from buoy and ship.
This database is only a part of the database from the LASIE campaign which includes also measurements of turbulent fluctuations of U components u', v' and w' , *T'*, humidity *q'* and *CO2* yet to be exploited.
The surface time series of wind and temperature show that during the central part of the campaign (days 19 and 20) warm air from land flows over a colder sea creating a stable surface layer.
This situation influences also the vertical structure of Θ and RH (Figure 2b) and the backscatter (Figure 3).

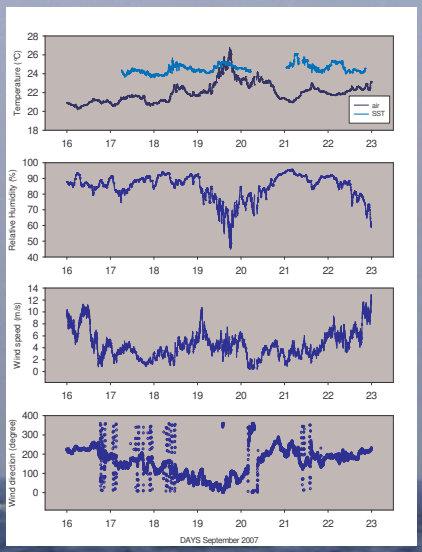

FIGURE 4. Surface data from the buoy ODAS-Italia1