

F. Molinos - Scientific report for the COST ES-0802 STSM

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This document is a brief report of the period I stayed in Lannemezan (France) from 14th June to 9th July 2011 under the supervision of Dr. Marie Lothon, who hosted me in the period coinciding with the Boundary Layer Late Afternoon and Sunset Turbulence (BLLAST) campaign. During my stay I have done a whole set of activities, some of them in cooperation with other research groups of the campaign, specially the one of the University of Bergen (UoB). The experience I had in previous campaigns in Spain in 2009, 2010 and 2011 with UAS allowed me to participate actively in cooperation with the SUMO team, from the UoB, and the multicopter team, from the University of Ost-Westphalen-Lippe (HSWOL).

The main interactions with those UAS teams during my stay were related with the design of flight strategies according to the meteorological conditions and the scientific purposes taking into account the data analysis of the gathered data from land stations.

I participated in the meetings that took place every morning during the campaign, where I learned how other people work and think in meteorological research. In those meetings the groups exposed their progress and their work plans for the day and the next days. I also participated in additional meetings in the evenings to discuss about the gathered data from the UAS and land stations.

Under the supervision of Dr. Lothon I performed the following field tasks:

- Give support to the tethered balloon teams at site 2, assisting in the preparation and calibration of the instruments and in the execution of the soundings. Two teams were working to take simultaneous measurements with five sensors at different levels to be able to compare temperature and wind data, those of CRA and those of the University of UTAH.
- Preparation and carrying out radio-soundings at site 1 during the night. To do this, I was previously instructed by CRA scientists and researchers for the University of Davis, California.
- Support to the multicopter team of the University of Ost-Westphalen-Lippe between 27th June to 6th July in site 1.
- Cooperation with the University of Bergen (UoB) that operated the SUMO UAS and the Surface Energy Station at site 1.

I also cooperated with the team of my University (University of the Balearic Islands - UBI) in the following tasks:

- Building, programming and installing at site 1 the surface based station of UBI. This station was specially designed for the BLLAST campaign to study small scale heterogeneities under stable conditions and working at high frequencies, and to inspect the transitions between day and night and between night and day. This land station was equipped with a temperature column of 8 thermocouples, 2 net radiometers and soil and humidity instruments.
- Preliminary data analysis of the gathered data including comparison of radiation measurements to the reference devices of PMOD-WRC (Davos, Switzerland)
- Comparisons between soil measurements of the UoB and UBI data, specially the heat flux, will be made after the campaign. Three heat flux plates were strategically located at 5, 10 and 20 cm below ground level and the data analysis could maybe be very interesting to calculate heat flux gradients.

Finally, I would like to remark that the scientific experience of my stay in Lannemezan with Dr. Marie Lothon has been very positive for myself and I feel happy to have contributed positively to the development of the campaign, very important for testing UAVs in research field campaigning. I hope to continue in collaboration with the CRA research team in the future and specially with Marie Lothon, to who I am very grateful for all her support and dedication to me.