M2 SOAC : Fiche de stage de recherche en laboratoire

Laboratoire : CNRM / GMEI / MNPCA

Titre du stage : UAV measurements of aerosol and energy flux over the tropical Atlantic Ocean

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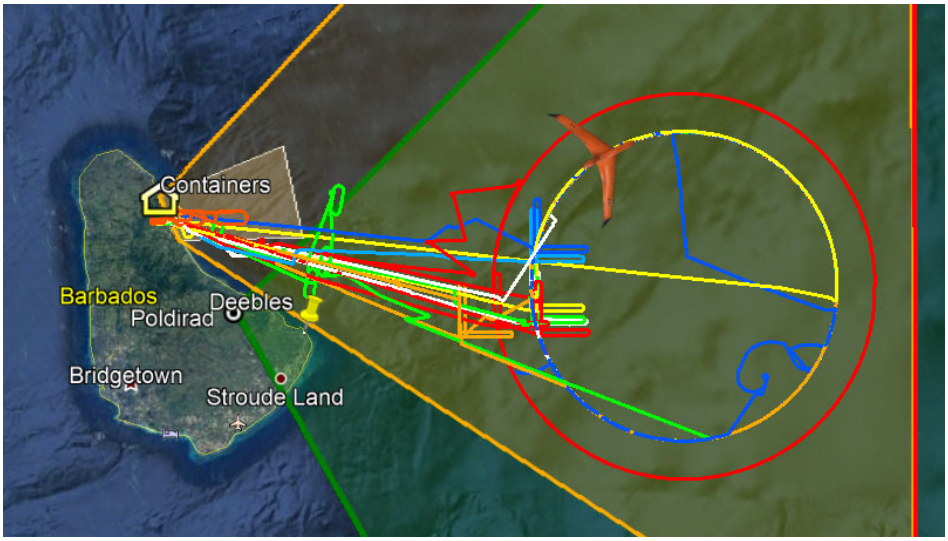
Sujet du stage :

The EUREC4A project (http://eurec4a.eu/) was an international measurement campaign coordinated by Sandrine Bony (LMD / CNRS, France), Bjorn Stevens (MPI, Germany) and David Farrell (CIMH, Barbados). Many institutions contributed to EUREC4A around the world, with a strong participation of French, German, British and American groups. The CNRM and the BOREAL SAS were invited to participate in the EUREC4A project, which took place between January 20 to February 20, 2020 on the island of Barbados. The Boreal UAV and payload developed during MIRIAD were well-adapted to the scientific needs of the EUREC4A campaign (Roberts et al., 2019).

The Boreal UAV conducted nine research flights for a total of 33 hours during the EUREC4A portion of the campaign (see figure below). For this experiment, the Boreal UAV was equipped to measure aerosols, turbulence, sea surface conditions, and meteorological state, as it consisted of the same payload that had been deployed during the MIRIAD / ReNovRisk campaign in La Réunion a year earlier (Bouquet et la., 2021). During the EUREC4A experiment, the Boreal UAV flew 20 km diameter circles at different altitudes along the trade wind alley upwind of the Barbados Climate Observatory.



The candidates will analyze the data the aerosol, meteorological and turbulence data and prepare the dataset for publication in ESSD. Data analysis will be performed using either Matlab or Python and the validated dataset will be integrated into AERIS.

References:

Bousquet O, Barruol G, Cordier E, Barthe C, Bielli S, Calmer R, Rindraharisaona E, Roberts G, Tulet P, Amelie V, Fleischer-Dogley F, Mavume A, Zucule J, Zakariasy L, Razafindradina B, Bonnardot F, Singh M, Lees E, Durand J, Mekies D, Claeys M, Pianezze J, Thompson C, Tsai C-L, Husson R, Mouche A, Ciccione S, Cattiaux J, Chauvin F, Marquestaut N. Impact of Tropical Cyclones on Inhabited Areas of the SWIO Basin at Present and Future Horizons. Part 1: Overview and Observing Component of the Research Project RENOVRISK-CYCLONE. Atmosphere, 12(5):544. https://doi.org/10.3390/atmos12050544, 2021.

Roberts, G., S. Barrau, R. Calmer, P. Tulet, O. Bousquet, La mesure des échanges air-mer par drone à grand rayon d'action pour les études des cyclones tropicaux, Meteo et Climat, 74, 2019.