

Processing of CH₄ release data and footprint processing

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Background

- There were 3 releases. One in May and 2 in August (daytime and nighttime)
- In the first release, the exploratory campaign, the pipe was located at a 312° azimuth from the tower, which was the prevailing wind direction at the time, and was moved at distances of 20, 40, and 60 m and at variable flow rates (Fig. 1b). This information allowed us to determine the use of a flow rate of 1.75 lpm, which was the optimal flow rate for the subsequent daytime experiment. For the second campaign, the release pipe was located at 20 m from the tower at an azimuth of 253° to try to match the forecast wind direction. This release point was activated during three days in roughly daytime hours (06:00-21:00 LT). The third release occurred three days after the end of the first release and was set at 180 m from the tower, at an azimuth of 253° , and activated only during nighttime hours (18:00-09:00 LT).

Release in May

- The pipe was located at canopy height (60 cm approx.)
- It ran for about 5 hours and we changed the flowrates, effectively modifying the source strength



Processing of raw data

- Raw data (20Hz) can be found in the Raw data folder
- We processed the data on 15-min intervals and the result are in the folder “Processed_15min”
- Processed data in current folder do not have a ustar filter
- Data were filtered by ustar threshold of 0.2 m s^{-1} before running the footprint

Creation of footprint

- Footprints were created from the 15-min flux data.
- The results of the footprint process are located in “Footprint_Output”
- BA: Tall tower
- BA2: Short tower
- Data can be analyzed and plots can be reproduced using:
Flux_validation_ALL_GOOD.m