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Comparative Analysis of Methane Emission Modeling in Complex Aerodynamics Environment: Stochastic, Gaussian Plume, and CALPUFF Modeling Approaches

Current Project Overview

This project aims to model the emission measured through MGGA (Microportable Greenhouse Gas Analyzer) via Stochastic, Gaussian Plume, and CALPUFF modeling approaches and compare them to quantify the best approach for various cases. The data is collected from the METEC facility where the emission rates are known, and meteorological data can be obtained using the sonic anemometer of the facility. The meteorological data is also obtained using Kestrel.

Research Progress

The emission data is being collected from the METEC facility and its viability is being checked by acquiring the necessary emission and meteorological data. Currently, the data collected is being analyzed, and modeling is ongoing.

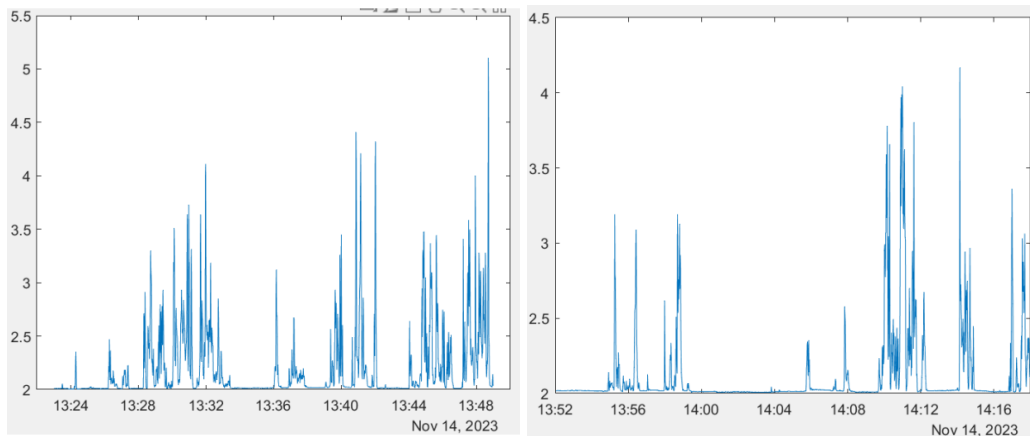


Figure: Demonstrating the plots between time vs CH4_ppm to verify that the first obtained emission data is adequate.

Research Plan

1. To run the Stochastic, Gaussian Plume, and CALPUFF models of the first obtained data and verify them. This will help in the learning and development of all three types of modeling that will be used in the project.
2. Field measurements for approximately six to eight months and modeling simultaneously.
3. Comparative study of all the above-mentioned models and preparation of conclusive evidence for the best model at specific conditions.
4. Write a research paper on this work, and a thesis on the same research or subject.

Publications

No publication yet

Literature Cited

No citation yet.