

Internship “Study of the secondary aerosols formation processes”

Description:

IFP Energies nouvelles is a major player in research and training in the fields of energy, transport, and environment. Among its objectives, IFPEN conducts research aimed at improving vehicle powertrains, as for example: internal combustion engines in the areas of energy efficiency and reducing pollutant emissions, as well as optimizing the use of fuels (liquids, gases, H₂, biofuels), internal combustion engine (ICE) hybridization or fuel cells.

While primary emissions of vehicles have been drastically reduced with the adoption of catalysts and particulate filters in recent decades, the impact that certain residual emissions may have on air quality requires further investigation. Indeed, some of the chemical species emitted by vehicles are likely, once in the atmosphere, to contribute to the formation of so-called “secondary” aerosols. It is possible to simulate these effects via atmospheric simulation chambers (ASC) or flow reactors (OFR), reproducing this type of processes (simulated atmospheric conditions, residence time, exposure, presence of precursors/radicals, etc.).

Integrated within the Mobilité et Systèmes division, in the IFPEN-Lyon powertrain technology department, your missions will be the following:

- Thanks to the extensive databases available (Web of Sciences,...), continue the bibliographic work already carried out within the division regarding the topic of secondary aerosols formation, in particular regarding oxidation flow reactors (OFR): conditions of use, quality and reproducibility conditions, key parameters, ageing processes, main differences with atmospheric and chamber conditions/processes
- Define protocols for using and validating the equipment to study the formation of such secondary aerosols, with regard to the field of transports
- From the work previously done and described missions, carry out an experimental campaign using the IFPEN equipment and protocols newly created, during which will be investigated the potential formation of secondary aerosols from model samples

The final deliverable of this internship will be a summary report of the work done highlighting for each part, the implemented actions, the key criteria to succeed, as well as the main results of the final experimental campaign. The newly developed protocols during the internship also will be saved as internal technical notes, to serve as a reference later.

Requested profile and skills:

Master 2 / engineer student with knowledge in physic and chemistry (atmosphere and aerosols in particular)

Use of computer/office softwares necessary to carry out the missions entrusted and daily activities

Interpersonal skills, rigour and initiative abilities

Writing quality, English language mastery (reading, writing)

Duration and dates: 5,5 months (24 weeks) from february/april 2023

Practical information: The internship will take place at IFP Energies nouvelles in Solaize (south of Lyon). The intern will be granted with a financial compensation (unless granted otherwise).

Interested ? Send a letter of motivation and a CV to :

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