

Research internship

Proposed subject: *Secondary Organic aerosol Formation by Organic waste Recycling in Agriculture*

Laboratories: INRAE, Unité « Écologie fonctionnelle et écotoxicologie des agroécosystèmes»
<https://www6.versailles-grignon.inrae.fr/ecosys>
Centre d'Enseignement et de Recherche en Environnement Atmosphérique
<https://www.cerea-lab.fr/>

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DESCRIPTION

Air quality is very much influenced by airborne particles. These particles have a strong impact on health. They are made up of different compounds, such as organics, which are mostly formed in the atmosphere. Understanding the mechanisms of their formation is essential to reduce the concentrations of particles. Agriculture and its activities affect local, regional and global air quality and global climate by its significant sources of emissions of ammonia, greenhouse gases but also through organic emissions. The valorisation of different types of organic waste products (OWP) from farms, urban origin or industrial is currently promoted as a substitute for mineral fertilizers. OWPs have a wide variety of characteristics due to their origin and the treatments that they may undergo before spreading and this diversity of characteristics could have a significant impact on organic emissions following soil application. These organic emissions are gaseous volatile organic compound (VOC) that contribute to the formation of particles, namely secondary organic aerosols (SOA). Models, such as the SSH-aerosol model, have been developed to represent the formation of particles and SOA from the gaseous precursors. This type of models has been used to represent the formation of particles from precursors emitted from traffic, heating etc.

The present project is focused on the study of SOA formation from organic waste products. The candidate will be in charge of:

- quantify in the literature the organic compounds emitted from OWP
- identify the compounds emitted by the OWP that are present/missing in the model.
- represent the formation of SOA of the missing compounds using laboratory experiments and literature available data.

This project is addressed to agronomist, physicist or chemist candidates interested in the experimental and modelling aspects of the research and motivated by the atmospheric impact of aerosols. This subject can be pursued as a thesis, funding is already secured.

Location: This internship will be mainly based at the CEREA/École des Ponts site in Champs sur Marne near Paris with visits to INRAE

Period: 5 to 6 months in 2023

Gratification

Keywords: air quality, volatile organic compounds, organic waste products, secondary aerosol formation