Post-doctoral position

Optical characterization of soot

Soot are produced in many combustion systems and processes. A good knowledge of the characteristics (quantity, size distribution, optical properties) of the soot are of importance at two levels:

- In the flame itself as the soot contribute to the radiation emitted by the flame, this radiation being an important heat source allowing pyrolysis or evaporation of the combustible
- In the produced smoke, as soot, associated with other particles, are an important source of pollution.

LEMTA, LRGP and LERMAB, three laboratories of the research federation Jacques Villermaux (FR2863) of the University of Lorraine are interested to develop an optical metrology allowing an in-situ characterization of soot directly in the flame or in hot smoke. Light-particle interaction (light extinction and scattering) will be used to get information onto the soot. In a first step the recruited person will develop an optical cell suitable to be inserted along the pipe connected to an adjustable source of soot (Jing Minicast©). The soot characteristics will be determined with a Scanning Mobility Particle Sizer Spectrometer (SMPS). An inverse method to get back soot characteristics in accordance with the one obtained by the SMPS from the optical data obtained in various operating conditions of the Minicast will have to be implemented. Finally the developed setup and inversion procedure will be applied to several cases interesting the three laboratories.

The position is available, starting in January 1st 2018 for one year, and will be located in Nancy, France

Required skills:
- Good experience in optical instrumentation
- A good knowledge in light-matter interaction, especially scattering of light by particles
- Knowledge in combustion and soot formation will be appreciated
- Skills in optical design (e.g. Zemax) will be appreciated

Contact:
Please send your application (CV + letter of motivation + 2 contact persons) to:

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