Internship opportunity

**Title:** Influence of bio-additives on the soot propensity of aeronautic related fuels

**Terms:** Applicants should be motivated individuals and pursue a Master degree in Mechanical or Chemical Engineering.

The position is expected to start from February or March 2016 and will last 6 months. The monthly allowance is 550 euros.

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**Topic context:** Soot represents a serious combustion hazard. Consequently, many studies have been achieved which gave significant insights of the physico-chemical processes that lead to soot formation and oxidation inside a flame. Late efforts are devoted to the characterization of some bio-additives on the soot production by aeronautic related fuels. Most of these additives are indeed extracted from material with a high cellulose content. Being already partially oxidized, these additives promote soot oxidation, which can be optimized.

**Scientific objectives:** The ultimate internship objective is the evaluation of the soot production propensity by mixtures of aeronautic related fuels incorporating bio-additives and the potential optimization of the trends.

**Expected progress:** The trainee will have to join a team of experimentalists to conduct experiments on the academic burner developed at Institut d’Alembert (University Pierre et Marie Curie-Paris6). This burner configuration is the one prescribed by McEnally et al., which exhibits a wide soot concentration database. The experimental diagnostics to be handled is the Laser Extinction Method (LEM), a non-intrusive technique exhibiting a high spatial resolution that enables soot concentration measurements. In parallel, the trainee will have to handle under the MATLAB environment a post-processing code that enables the interpretation of the signal provided by the LEM. In a final step, soot production propensities of aeronautic related fuels mixed with a selection of additives will be evaluated and compared.

**References:**