
Postdoctoral position in:

Behavior of aeronautic composites under flames

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Keywords: Aeronautical composites, fire, kerosene or propane flames, test bench, thermal decomposition, temperature measurement.

The use of innovative composite materials in aeronautical applications is confronted today to ever more demanding safety standards, and it is imperative to bring reliable and relevant answers. Also, allow the aeronautics industry to understand / predict the thermal response of their materials in different configurations, in particular when they are exposed to flames, is essential.

The aim of the project is the development of an innovative testing platform allowing to expose composite samples under heat fluxes in the range 100-200 kW/m² supplied by propane or kerosene flames, in order to understand the mechanisms of composite degradation.

A position is currently open through a regional funding. The research responsibilities entail:

- The optimisation of existing bench tests.
- To develop a thermo-phosphorescence laser measurement technique that allows to measure the temperature on composite surfaces during tests.
- To measure the flow velocity near the wall by laser diagnostic (LDV, PIV)
- To measure and analyse the wall heat flux supplied by the flames.
- To compare the thermal degradation of aeronautical composite materials submitted to a propane or kerosene flames, particularly the composite materials with better fire resistance (via the addition of flame retardant fillers).

Candidates should have a PhD in mechanical engineering, with skills in reactive fluid mechanics and optical diagnostics. Experience in conducting combustion experimentations. Ability to write tools in Labview and Python is a plus.

CNRS-CORIA activities are centered on research fields related to energy and propulsion systems. The reactive flows department is primarily devoted to develop and implement cutting edge laser-based diagnostics to a large variety of industrial applications (e.g. aerospace or fire and safety science) [1,2]. This project is part of the AEROFLAM project (Development of a platform for the study of the thermo-mechanical behavior of composite used in aeronautic, in collaboration with GPM CNRS laboratory) [3,4].

The funding is secured for 1 years at CNRS-CORIA laboratory (Rouen, France), with possibility to renew (subject to additional funding and satisfactory performances). For more information, please contact Prof. Alexis Coppalle (coppalle@coria.fr).

Interested candidates should send a detailed academic CV

1- E.Schuhler, A.Coppalle, B.Vieille, J.Yon, Y.Carpier, Polymer Degradation and Stability

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2- N.Grange, K.Chetehouna, N.Gascoin, A.Coppalle, I.Reynaud, S.Senave, Fire Safety Journal, Volume 97, 2018, Pages 66-75

3- M.A.Maaroufi, Y.Carpier, B.Vieille, L.Gilles, A.Coppalle, F.Barbe : Composites Part B: Engineering, Volume 119, 15, 2017, Pages 101-113

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