



TEMPORARY CONTRACT AT LCAE/LIST (CEA Paris-Saclay, France)
ON LINE FLASH BEAM MONITORING DETECTOR DEVELOPMENT

18 months from starting date. To be filled September 2021, at CEA⁽ⁱ⁾ Paris-Saclay, France.

We are currently seeking a talented and qualified candidate to contribute to the development a specific detector based on a fast scintillator coupled of SiPM sensor for on line FLASH beam monitoring.

Recent results have shown that use of very high dose rate (FLASH) irradiation with electrons was as efficient as gamma rays for tumor inhibition in cancer treatment using radiotherapy. Nevertheless developments are still limited due to the difficulties to get an accurate characterization (dose, temporal response) of these beams.

The goal of this research and development work is to provide a suitable detector for measurements of charged particle beams with VHDR, i.e. with high doses per pulse or with ultrashort pulse duration (from mGy to Gy per pulse, from ns to μ s pulse durations).

This work will be performed inside the ASTROLABE project funded by INSERM in which two laboratories are involved, LCAE⁽ⁱⁱ⁾ from CEA and IC-CPO⁽ⁱⁱⁱ⁾ from Institut Curie. The candidate will work closely with the instrumentation physicists from LCAE (CEA) to develop the device and with the medical Physicist (IC-CPO) to performed the FLASH beam characterizations.

A monolithic prototype based on ultra-fast plastic scintillator coupled to a silicon photomultiplier (SiPM) sensor with dedicated electronic will be tested at DOSEO platform at CEA which houses an electron beam from Elekta accelerator. This will enable characterizing the device before evaluation with VHDR beams of electrons from IC-CPO platform. In parallel a pixelisated version of the prototype will be investigated for on line beam monitoring.

Candidate profile:

- PhD or engineer in instrumentation or applied nuclear physic;
- Experience in Monte Carlo simulation codes (MCNP6 or GEANT4) and scientific programming (Matlab, Python);
- Interest in designing detectors and performing experimental tests;
- High motivation to work within a multidisciplinary project;
- Curiosity and enthusiasm.

Interested candidates should submit cover letter, curriculum vitae with a publication list to:

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i French Alternative Energies and Atomic Energy Commission / Commissariat à l'énergie atomique et aux énergies alternatives

ii Sensors and Electronic Architectures Laboratory / Laboratoire capteurs et architectures électroniques

iii Institut Curie – Orsay Proton Therapy Center / Institut Curie – Centre de Protonthérapie d'Orsay