PROPOSITION
DE STAGE

ANNÉE UNIVERSITAIRE 2024/2025

INFORMATIONS

Organisme/Institution : Université Paris-Saclay

Laboratoire/Laboratory : Laboratoire de Physique des Gaz et des Plasmas

Adresse du lieu de stage/Lab address : Bat 210, Campus d'Orsay, Université Paris Saclay

Responsable de stage/Supervisor : Francesco Massimo

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Conditions de stage (rémunération,voyage,logement,cantine, ...)/internship conditions (stipend,travel,lodging, food,...) : Compensation and canteen prices as per M2 internships

RÉSUMÉ DU SUJET / INTERNSHIP DESCRIPTION

NUMERICAL MODELING OF MULTI-STAGE LASER WAKEFIELD ACCELERATION

Laser Wakefield Acceleration (LWFA) is a physical mechanism able to generate high-amplitude electric fields that can accelerate electron beams to high energies in short distances. This physical phenomenon relies on nonlinear laser-plasma interaction mechanisms in diverse regimes of parameters, depending on the desired applications. Understanding these physical mechanisms to harness the full potential of this electron acceleration technique requires extensive numerical investigations, with the objective of designing and analysing experiments.
The team ITFIP is deeply involved in a theoretical and numerical modelling program, aiming at demonstrating in the long term LWFA configurations using multiple plasma stages, to increase the scalability of LWFA technology and reduce the size of high-energy electron accelerators.
The proposed internship is tied to the numerical modelling required for the design of the components of these experiments, in particular a long plasma accelerator stage, where a laser pulse must be guided for a long distance. The internship work will include numerical modelling studies performed through PIC (or reduced PIC) simulations for LWFA.
The methods and/or the results of the internship will contribute to the laser-plasma acceleration experimental campaigns where the team ITFIP is involved with multiple collaborators in the Plateau of Saclay and at the international level.

POSSIBILITÉ DE THÈSE/ PURSUING INTO PHD

Possible, à discuter; To be discussed

CONTRAT-FINANCEMENT PROBABLE / EXPECTED CONTRACT-FUNDING ?