

DRF: Thesis SL-DRF-19-0597

## RESEARCH FIELD

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Plasma physics and laser-matter interactions / Corpuscular physics and outer space

## TITLE

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Control of ionization front in tokamak divertor: impact of particle and heat sources dynamics in WEST long pulse plasmas

## ABSTRACT

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The essential characteristic of the WEST tokamak is to offer plasma-wall interaction conditions that are close to those of future reactors. In the divertor, the region dedicated to the plasma-wall interaction, depending on the sources of particles and heat, transitions are observed between several phases separated by ionization and recombination fronts. Controlling the dynamics of these fronts is crucial to guarantee the tokamak's fusion performance.

In this context, the long pulse experiments in WEST with its actively cooled divertor, will achieve for the first time an equilibrium regime in the neutral-plasma facing components interaction. This will develop an in-depth experimental knowledge of frontier control, tackled with the support of the new generation of simulation tools.

The student will propose specific experiments to characterize the different operating regimes and to determine the relevant measurements and actuators for the real-time control of the position of the ionization front.

## LOCATION

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Institut de recherche sur la fusion par confinement magnétique

Service Intégration Plasma Paroi

Groupe Physique du Plasma de Bord

Place: Cadarache

Start date of the thesis: 01/10/2019

## CONTACT PERSON

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## UNIVERSITY / GRADUATE SCHOOL

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Aix-Marseille Université

Sciences pour l'Ingénieur : Mécanique, Physique, Micro et Nanoélectronique - Aix-Marseille Université -

## FIND OUT MORE

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<http://west.cea.fr>

## THESIS SUPERVISOR

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