

Alfven waves in turbulent MHD flow

Master Research

Summary (400 caractères maxi)

The master student will study experimentally the turbulence of liquid metal under high magnetic field. The focus is set on the role of wave propagation in the statistical properties of turbulence statistical. Turbulence is generated inside a pool of liquid metal placed inside one of the high field magnet of the LNCMI. Under these conditions the electromagnetic force acquire a specific propagative behavior (known as Alfven waves).

Detailed subject (1200 caractères maxi dont une figure possible)

The aim of the study is to combine the diffusive and propagative effect in a pool of liquid metal submitted to high magnetic field conditions in order to mimic at the laboratory scale the mechanisms that are present in astrophysical and planetary systems as well as in nuclear reactors.

The flow will be characterized by combining ultrasound velocimetry probes and electrical potential measurements at the walls. The candidate will perform measurements and analyze the results to better understand the transitions between the different hydrodynamic regimes. In this frame, a theoretical work could be led to extend/adapt the Alfven wave Theory to these specific experimental conditions

The candidate should be in the last year of its Master (or last year of an Engineering School) with a solid background in fluid mechanics. The candidate must be motivated by the conduct of highly technological projects.

Funding is available for a PhD on the topic upon satisfactory completion of the Msc. The will be in a regime of co-tutelle (between Grenoble, and Coventry University – UK), it will be located in Grenoble with several stays in Coventry.

Do not hesitate to contact us for further information !

Publications linked to the theme

Background and skills expected : MHD or strong Hydrodynamics background,

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