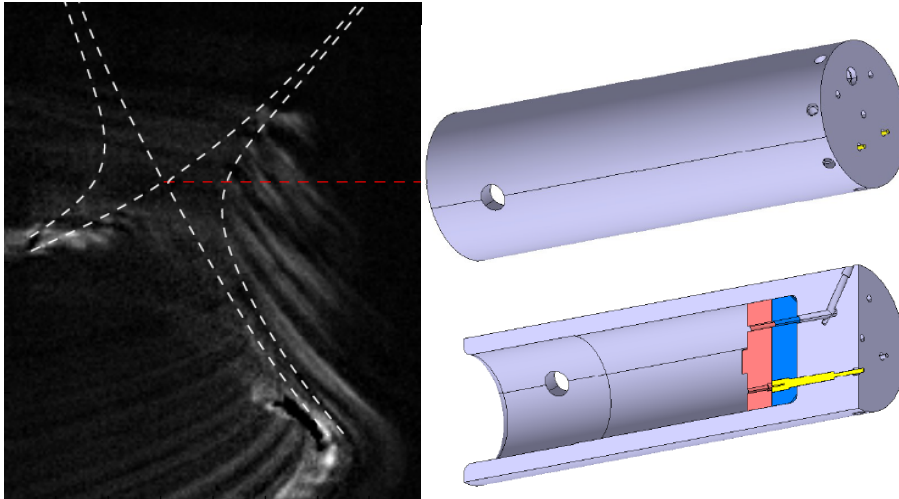


Potential PhD opportunities in MCF plasma at CFSA, University of Warwick

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Turbulence in the boundary layer of a tokamak device is complex, with multiple regions displaying differing characteristics. Despite this complexity, understanding turbulent transport in the scrape-off layer remains a critical step towards achieving predictive capability for future fusion devices. Research into cross-field transport inside the divertor volume has been historically neglected, however it may strongly impact on the operation of a fusion reactor. The UK's flagship tokamak, MAST-Upgrade, will begin experimental operations in 2019, with a strong focus on the physics of the divertor. This project will provide a deep and systematic experimental analysis of cross-field turbulent transport in the divertor volume of MAST-Upgrade using a specialised probe diagnostic.



Left: Turbulence in the divertor volume of MAST captured with high speed imaging
Right: Typical design of a probe head for the MAST reciprocating probe system

The PhD candidate will be responsible for designing a new probe head for the reciprocating probe system on MAST-U. By benchmarking the design with synthetically generated turbulent signals, the probe will be optimized for measurements of turbulent characteristics at the design level. The candidate will be responsible for building the probe head, and operating the probe system during MAST-U experiments. By comparing results obtained on the probe both upstream, adjacent to the hot plasma core, and in the divertor volume, a deep study of similarities and differences of the turbulent transport in the divertor volume will be obtained. The candidate will be required to spend a significant portion of the PhD on site at CCFE, Oxfordshire and will be responsible for carrying out experiments on the MAST-U machine, attending international conferences and publishing in relevant journals.

Please note that the availability of this project is contingent on funding decisions to be made in January 2019.