



Final Year Project 2017/2018



Parameterization of ion temperature vs. plasma parameters

Using the mirror plasma experiment in the plasma physics laboratory, the student will become familiar with basic plasma measurement techniques and explore the plasma parameters achievable in a magnetic mirror configuration.

468.6 nm He II lines will be recorded for a wide variety of plasma parameters. The student will learn the concept of Tikhonov regularization for optimal information retrieval from noisy or incomplete data and hence obtain the best possible parameterization of T_{ion} vs. plasma parameters (plasma current, heating power, helium pressure, electron density, electron temperature) from his/her experimental data. These results will form an important component of an ongoing project to develop an electron temperature and density diagnostic based on He I line ratios in the divertor leg region of the Mega Ampere Spherical Tokamak (MAST) Upgrade experiment which is planned to start operating in summer 2018 at the Culham Centre for Fusion Energy, Oxfordshire.

If there is sufficient interest, a second computational project may be offered based on statistical analysis of a database of magnetohydrodynamic equilibrium states.