

Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Exploitation of high resolution beam spectroscopy diagnostics on MAST CLIVE MICHAEL, MAARTEN DEBOCK, NEIL CONWAY, ROB AKERS, LYNTON APPEL, ANTHONY FIELD, MIKE WALSH, MARCO WISSE, Euratom/UKAEA Fusion Association, Culham Science Centre, Abingdon, OX14 3DB, UK, MAST TEAM — Recent developments in beam spectroscopy on MAST, including CXRS, MSE and a pilot FIDA system have revealed new information about phenomena such as ITBs, MHD instabilities, transport and fast particle physics. For example, ITBs in the ion temperature and toroidal rotation have been observed with the 64ch CXRS system, while reverse-shear q profiles have been observed with the recently commissioned 35ch MSE system. Thus, the synergy of these diagnostics helps us to understand, among other things, the role of magnetic and rotational shear on ITBs. MSE measurements have also helped to understand MHD phenomena such as locked modes (characterized by changes in toroidal momentum, revealed by CXRS), sawteeth, and internal reconnection events. Finally, the temporal/spatial resolution and SNR of the MSE system have been exploited. Interesting results include the detection of low frequency ($\sim 2\text{kHz}$) magnetic field fluctuations, characterization of the radial structure of higher frequency ($< 100\text{kHz}$) broadband and coherent density (BES) fluctuations, and the identification of short scale length features ($\sim 1.8\text{cm}$) in the current profile near the edge pedestal.

Richard Buttery
Euratom/UKAEA Fusion Association,
Culham Science Centre, Abingdon, OX14 3DB, UK

Date submitted: 21 Jul 2009

Electronic form version 1.4