

Abstract Submitted
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Detection and application of Doppler and motional Stark features in the DNB emission spectrum in the high magnetic field of the Alcator C-Mod tokamak¹ IGOR BESPAMYATNOV, WILLIAM ROWAN, KENNETH LIAO, The University of Texas at Austin, ROBERT MUMGAARD, ROBERT GRANETZ, Massachusetts Institute of Technology, STEVE SCOTT, Princeton Plasma Physics Laboratory — The spectral region in the vicinity of the D_α line is to be studied with a high resolution spectrometer. This region contains spectral lines emitted by atoms in the diagnostic neutral beam (DNB) and plasma atoms and ions. Spectrally isolated emission serves as a measure of the properties of emitting particles and surrounding medium. In C-Mod, the main obstacle for application of these techniques is that at high magnetic fields (5-8T) the spectral separation due to motional Stark splitting is similar to the spectral Doppler shifts of lines emitted by DNB atoms of energies 50, 25 and 18 keV. This results in partial blending of observed spectral lines and consequent masking of Doppler or Stark effect. High spectral resolution ($\sim 1\text{\AA}$) and complex spectral fitting technique are needed for isolation of different components. Results of this work will be used in the further development of Beam Emission Spectroscopy (BES) system installed at C-Mod and in support for the current Motional Stark Effect (MSE) diagnostic.

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