

Abstract Submitted
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Atomic and Molecular Spectroscopic Studies of the DIII-D Neutral Beam Ion Source and Neutralizer¹ B. CROWLEY, J. RAUCH, J.T. SCOVILLE, GA, S.K. SHARMA, B. CHOKSI, Institute for Plasma Research, India — The neutral beam system is interesting in that it comprises two distinct low temperature plasmas. Firstly, the ion source is typically a filament or RF driven plasma from which ions are extracted by a high voltage accelerator grid system. Secondly the neutralizer is essentially a low temperature plasma system with the beam serving as the primary ionization source and the neutralizer walls serving as conducting boundaries. Atomic spectroscopy of Doppler shifted D-alpha light emanating from the fast atoms is studied to determine the composition of the source and the divergence of the beam. Molecular spectroscopy involves measuring fine structure in electron-vibrational rotational bands. The technique has applications in low temperature plasmas and here it is used to determine gas temperature in the neutralizer. We describe the experimental set-up and the physics model used to relate the spectroscopic data to the plasma parameters and we present results of recent experiments exploring how to increase neutralization efficiency.

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