

Abstract Submitted  
for the DPP15 Meeting of  
The American Physical Society

**Langmuir Probe and Spectroscopic Studies of the DIII-D Neutral Beam Ion Source**<sup>1</sup> S. GUERRA, San Diego State University, B. CROWLEY, GA — The Neutral Beam system on DIII-D consists of eight ion sources on four beamlines. The ion source is a filament driven magnetic bucket design. The source utilizes a Langmuir probe in a feedback control loop to set the plasma density for the desired beam extraction current. Until now, the probe operated in single-point ion-saturation mode which provided information about the plasma ion density  $N_i$ . Here we report on a project in which the probe circuitry is modified to enable I-V probe traces to be obtained. Hence, plasma parameters that were not measured heretofore are now available. Namely, the electron temperature  $T_e$  and plasma potential  $V_p$ . The Energy Electron Distribution Function (EEDF) is also obtained and provides further information about the source. Additionally atomic spectroscopy of Doppler shifted D-alpha light emanating from the fast atoms is studied to determine the ion species composition in the source and the divergence of the beam. The new measurements will be used to optimize ion source performance.

<sup>1</sup>Work supported by US DOE under DE-FG02-07ER54917, DE-FC02-04ER54698

B. Crowley  
General Atomics

Date submitted: 22 Jul 2015

Electronic form version 1.4