

Abstract Submitted  
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**Electron Energy Distribution Function Measurements in a Negative Hydrogen Ion Source**<sup>1</sup> JOHN BLANDINO, ZACHARY TAILLEFER, Worcester Polytechnic Institute, LYNN OLSON, Busek Co. Inc. — A High Pressure Discharge Negative Ion Source (HPDNIS) operating on hydrogen has been built and tested. The HPDNIS uses an RF discharge operating in a pressure range of 10s to 100s of Torr. Gas from this discharge flows through an orifice into a lower pressure (10s of mTorr), negative ion production region designed to maintain low electron temperature and enhance negative ion formation through dissociative attachment. Plasma exiting the negative ion production region is extracted through a biased grid set with separation of negative ions and electrons achieved via an applied magnetic field. This presentation will describe measurements of the electron energy distribution function (EEDF), in the negative ion production region, made using a single Langmuir probe based on the Druyvesteyn method. The presentation will discuss challenges to using this method as a result of complications arising from the presence of negative ion species, collisionality, and RF induced distortion of the EEDF. The presentation will also summarize estimates of the rate constant for collisional processes such as dissociative attachment, made using the measured EEDFs in the negative ion production region of the HPDNIS.

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John Blandino  
Worcester Polytechnic Institute

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