

Abstract Submitted  
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**High Pressure Discharge Negative Ion Source**<sup>1</sup> LYNN OLSON, Busek Co., Inc., JOHN BLANDINO, NIKOLAOS GATSONIS, Worcester Polytechnic Institute — A high pressure discharge negative ion source has been developed with the goals of high duty cycle, high current, and good reliability, with the ultimate aim of providing a source for a facility such as the Spallation Neutron Source. The discharge itself has been characterized running on hydrogen and helium over pressure ranges of 10s to 100s of torr, with the pressure varied both by changing the flow rate and exit orifice diameter. A key part of the characterization was the power required for the E-H transition as a function of the pressure and gas flow. Running on hydrogen, a biased grid set has been used to extract negative current from a negative ion production region downstream from the discharge exit orifice and an electromagnet has been used to separate electrons from the negative ions. Initial measured efficiency for negative ion current has been in the range of 1-2 mA/kW.

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