

Abstract Submitted  
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**A Helicon Ion Source for the SNS Power Upgrade**<sup>1</sup> F.W. BAITY, R.H. GOULDING, R.F. WELTON, M.P. STOCKLI, Y. KANG, Oak Ridge National Laboratory — The SNS Power Upgrade will require an ion source capable of producing negative hydrogen ion (H<sup>-</sup>) beams of 70-95 mA, depending on source emittance, with a duty factor of 7.4%. Presently no sources in operation at existing accelerator facilities can simultaneously meet these requirements of beam current, emittance, duty factor with a reasonable lifetime. The possibility of meeting these requirements by combining a helicon hydrogen plasma generator previously developed in the Fusion Energy Division (FED) at ORNL with the existing SNS-LBNL H<sup>-</sup> ion source will be discussed. Both these systems have been highly optimized and reflect the current state-of-the-art in high-density hydrogen plasma production and high-brightness H<sup>-</sup> generation. The helicon plasma generator has demonstrated the capability of producing hydrogen plasma densities up to an order of magnitude greater than in the current SNS-LBNL source.

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