

Abstract Submitted  
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**High Duty Factor (DF) Testing of a Saddle Antenna Radio Frequency Surface Plasma Ion Source (SA RF SPS)** JEFFREY BREITSCHOPF, Texas Lutheran University, VADIM DUDNIKOV, ROL JOHNSON, Muons, Inc., JERRY CARR JR., Texas Lutheran University, ROBERT WELTON, BAOXI HAN, SYDNEY MURRAY JR., TERRY PENNISI, CHIP PILLER, MANUEL SANTANA, MARTIN STOCKLI, ORNL, GALINA DUDNIKOVA, University of Maryland, College Park — A SA RF SPS was tested at the Spallation Neutron Source (SNS) at Oak Ridge National Lab. Hydrogen ions were extracted from the source as described in Dudnikov et al. (2011).<sup>1</sup> Modifications were installed to increase ion beam output and optimize cooling. The source was tested under a DF of 5-20% at 150 Hz as well as a continuous beam with power ranging from 0.8 kW to 3.3 kW. Cesium was also used to optimize H- beam output.<sup>2</sup> The highest beam produced was 13 mA at 2.5 kW. The SA RF SPS has an ion production efficiency of  $\sim 5$  mA/kW while the current ion source at the SNS produces  $\sim 1$  mA/kW.<sup>3</sup> The SA RF SPS will be tested with the conditions of the linear accelerator at the SNS so the recent accelerator-based pulsed neutron record of 20 GW (1.4 MW average power)<sup>4</sup> can be surpassed.

<sup>1</sup>Dudnikov, V., et al., AIP Conf. Proc. 1390, 411 (2011).

<sup>2</sup>Dudnikov, V., Method of Negative Ion Production, Patent cccp 411542, 10 March, 1972.

<sup>3</sup>Welton, R. F., et.al. AIP Conf. Proc. 925, 87 (2007).

<sup>4</sup>A Record-Breaking Month for ORNL's Spallation Neutron Source  
[www.ornl.gov/ornl/news/features/2014](http://www.ornl.gov/ornl/news/features/2014)

Jeffrey Breitschopf  
Texas Lutheran University

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