

Abstract Submitted
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Progress on the ORNL high power, high particle flux helicon hydrogen plasma source¹ RICHARD GOULDING, G. CHEN, S.J. MEITNER, L.W. OWEN, F.W. BAITY, T.M. BIEWER, J.B.O. CAUGHMAN, M.J. COLE, D.A. RASMUSSEN, D.O. SPARKS, Oak Ridge National Laboratory — A high power, high particle flux helicon plasma source has been constructed at ORNL. This electrode-less, high ionization fraction RF plasma source is a short pulse (≤ 3 s) prototype that will provide data needed to design a long pulse version for incorporation into in a high power flux (~ 20 MW/m²) linear plasma-surface interaction (PSI) test stand. The source will produce high density hydrogen and deuterium plasmas with density $>10^{19}$ m⁻³, and total ion production $\geq 10^{21}$ s⁻¹. It consists of a 1.3 m long, 15 cm diameter vacuum chamber, with a helical antenna transmitting rf power at $f= 10$ -26 MHz through a cylindrical aluminum nitride (AlN) vacuum window 30 cm in length, and four circular coils creating an axial magnetic field with $|B| \leq 0.8$ T. Results of initial operation will be presented.

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