

Helicon plasma source optimization studies for VASIMR* R. H. GOULDING, F. W. BAITY, G. C. BARBER, M. D. CARTER, F.R. CHANG DÍAZ¹, D. PAVARIN², D. O. SPARKS, J. P. SQUIRE¹, *Oak Ridge National Laboratory*. A helicon plasma source at Oak Ridge National Laboratory is being used to investigate operating scenarios relevant to the VASIMR (VARIABLE Specific Impulse Magnetoplasma Rocket). These include operation at high magnetic field (0.4 T), high frequency (30 MHz), high power (3 kW), and with light ions (He⁺, H⁺). To date, He plasmas have been produced with $n_{e0} = 1.7 \times 10^{19} \text{ m}^{-3}$ (measured with an axially movable 4mm microwave interferometer), with $P_{in} = 1 \text{ kW}$ at $f = 13.56 \text{ MHz}$ and $|B_0| = 0.16 \text{ T}$. In the near future, diagnostics including a mass flow meter and a gridded energy analyzer array will be added to investigate fueling efficiency and the source power balance. The latest results, together with modeling results using the EMIR rf code, will be presented.

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