

Abstract Submitted  
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**Operation of a microwave plasma source for electron heating and antenna testing**<sup>1</sup> J.B.O. CAUGHMAN, T.S. BIGELOW, S.J. DIEM, R.H. GOULDING, D.A. RASMUSSEN, C.R. SCHAICH, T.L. WHITE, ORNL — One of the major challenges for magnetic fusion is the interaction of the plasma with materials. Linear plasma-material interaction test stands can benefit from additional electron heating of the high-density source plasma to increase the total plasma heat flux at the target to better simulate fusion reactor conditions (10-20 MW/m<sup>2</sup>). A microwave-based plasma experiment has begun at ORNL to study electron heating of over-dense plasmas and to provide a plasma environment for antenna testing. The plasma is generated by high-field launched whistler waves at 18 GHz to create a moderate-density plasma ( $n_e \sim 10^{18}/\text{m}^3$ ). Electron heating of the over-dense plasma is provided by either whistler waves or electron Bernstein waves at 6 GHz. In addition, a single strap mockup antenna, designed to operate at 40-50 MHz, is being constructed to study near-field plasma interactions. The antenna will be placed in the experiment's central vacuum chamber, which will act as an rf test facility.

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