

Abstract Submitted  
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**ORNL diagnostic and modeling development for LAPD ICRF experiments**<sup>1</sup> R.C. ISLER, J.B.O. CAUGHMAN, C. LAU, E.H. MARTIN, ORNL, R.J. PERKINS, PPPL, B. VAN COMPERNOLLE, S. VINCENA, S.K.P. TRIPATHI, W. GEKELMAN, UCLA — PPPL, UCLA, and ORNL scientists have recently collaborated on a three week ICRF campaign at the upgraded LAPD device to study near field-plasma interactions associated with a single strap antenna driven at 2.38 MHz with 100 kW of RF power. This poster highlights ORNL involvement through implementation of the following diagnostics: an optical emission probe to measure neutral density, a retarding field energy analyzer to measure fast ions, phase locked imaging to measure line integrated RF-driven optical emission fluctuations, and an RF compensated triple Langmuir probe to measure density and temperature. To interpret the results of the experimental campaign a 3D cold plasma finite element model with realistic antenna and vacuum vessel geometry was developed in COMSOL. A summary of these results will be discussed. Highlights include a proof of principle localized and spatially resolved measurement of the neutral density, a strong increase in RF-driven optical emission fluctuations directly in front of the RF antenna strap, a shift in fast ion energies near the plasma edge, and qualitative agreement between the COMSOL cold plasma model with the various diagnostics.

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