

Abstract Submitted  
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**Overview of the electric propulsion plasma diagnostics suite for the VASIMR VX-200 testbed** CHRISTOPHER OLSEN, BENJAMIN LONGMIER, MAXWELL BALLENGER, JARED SQUIRE, TIM GLOVER, MARK CARTER, Ad Astra Rocket Company, EDGAR BERING, MATTHEW GIAMBUSSO, University of Houston, AD ASTRA ROCKET COMPANY/UNIVERSITY OF HOUSTON TEAM — Descriptions of the various plasma diagnostics and data analysis methods are given for instruments used in high power ( $> 100$  kW) electric propulsion testing. These include planar Langmuir probes, an articulating retarding potential analyzer, a double Langmuir probe, a multi-axis magnetometer, a high frequency electric field probe, microwave interferometer, and momentum flux targets. These diagnostics have been used to measure the efficiencies of the thruster, plasma source, ion cyclotron resonance booster, and magnetic nozzle as well as used to explore physical phenomena in the plume such as ion/electron detachment, plasma turbulence, and magnetic field line stretching. Typical plume parameters range up to  $10^{13}$   $\text{cm}^{-3}$  electron density, 1 kG applied magnetic fields, ion energies in excess of 150 eV, and cold electrons (2 – 5 eV) with a spatial measurement range over 2 m.

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