

Abstract Submitted
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Miniaturization of a Combination Langmuir/Mach Probe P.A. MELNIK, T. DEHART, D. LOTZ, University of Washington, Redmond Plasma Physics Laboratory — A combination Langmuir/Mach probe has been developed to measure electron temperature and density as well as ion flow speed in TCSU. The probe is fully translatable allowing it to diagnose all radial locations of the FRC at either the mid-plane, end section, or in the exhaust jets. The 1/4" probe stalk consists of interlocking boron nitride cylinders which encompass a 1/8" diameter stainless steel tube that houses the probe wires. In addition to the stainless steel jacket the probe wires are twisted to minimize electromagnetic noise pickup. The tip of this combo probe is composed of a boron nitride housing and eight .020" diameter tungsten collection leads. In TCSU, the RMF used to form and sustain the FRC makes Langmuir probe measurements difficult. To this end we have developed a drive circuit that will generate the bias voltages necessary for Langmuir probe operation. This bipolar power supply can produce steady voltages up to 200 volts at loads over 1 amp and can be swept at any frequency up to 1.5 MHz. The probe current and bias voltage will be recorded with an amplifier and transmitted via fiber optic to a receiver allowing the signals to be digitized.

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