

Abstract Submitted
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Development of Magnetically Insulated Baffled Probe Cluster for Measurement of Energy Flux and Particle Flux in the Texas Helimak¹ S.H. NOGAMI, M. KOEPKE, V. DEMIDOV, West Virginia University, C. WILLIAMS, K. GENTLE, University of Texas, Austin — Progress is reported in employing magnetically insulated baffled (MIB) probes² in the Texas Helimak³. Radial scans at the plasma edge of dc and ac space potential are presented. Like the Ball-Pen probe⁴, the MIB probe shares the Langmuir probe simplicity and overcomes its shortcomings in the ability to make real-time measurements of plasma space potential, temperature, and energy/particle fluxes in magnetized plasma. By rotating the probe shaft to change the extent to which the baffle “masks” the probe collection area, the ratio between electron and ion probe current, and consequently the relative sensitivity of the floating-probe oscillations to space potential and electron/ion temperature, can be adjusted, thus allowing space potential fluctuations and electron/ion temperature fluctuations to be distinguished when measured at two different rotation angles. At the optimal rotation angle, the contribution of electron temperature and its fluctuations to the floating-potential measurement are eliminated and the space potential fluctuation phase is preserved.

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²*RSI* 73, 3409, 2002; *CPP* 44, 689 (2004); *J. Phys. D* 44, 233001 (2011); *RSI* 81, 10E129 (2010)

³*PoP* 21, 092302 (2014)

⁴*CPP* 54, 279 (2014)

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