

Abstract Submitted
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Magnetically insulated baffled probe for measurements in complex magnetized plasma diagnostics¹ CHENGGANG JIN, RAITSES YEVGENY, Princeton Plasma Physics Laboratory, Princeton, New Jersey 08543, USA, VLADIMIR DEMIDOV, Department of Physics, West Virginia University, Morgantown, West Virginia 26506, USA — When the magnetic field is parallel to the probe surface, the electron-repelling sheath can be significantly reduced as the magnetic field also impedes the cross-field electron flow and therefore, a smaller sheath voltage is needed to maintain the zero current balance to the floating probe. This is the basic idea of the magnetically insulated baffled (MIB) probe, which offers the advantages of direct measurements of the plasma potential in magnetized plasmas while being non-emitting and electrically floating [1]. A simplified MIB probe was constructed by retracting the conducting pin of a classical Langmuir probe inside an insulating tube placed perpendicular to the magnetic field lines. The retracting distance of the collector inside the ceramic tube was calculated assuming classical and anomalous mechanisms of the electron cross-field diffusion and taking into account particles losses inside the tube. The results of MIB probe measurements in a Penning-type cross-field discharge are presented.

[1] V. I. Demidov et al., Rev. Sci. Instrum. 81, 10E129 (2010).

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