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Probe Techniques for Plasma Potential Measurements in a Low-Temperature Magnetized Plasma[1] BRIAN KRAUS, YEVGENY RAITSES, Princeton Plasma Physics Laboratory — We report results of measurements of plasma potential in a cross-field discharge of a cylindrical Penning configuration with magnetized electrons and non-magnetized ions. Measurements were conducted using three different probe types, including swept biased Langmuir probe, floating emissive probe and a magnetically-insulated probe [1]. Depending on the operating parameters of the Penning discharge, such as gas pressure (0.1-10 mTorr of Xenon, Argon) and magnetic field (10-100 Gauss), the plasma in this Penning discharge can be subject to the enhancement of electron cross-field transport compared to classical collisional transport [2]. We compare the three probe techniques and discuss the applicability of the magnetically-insulated probe for measurements in magnetized plasmas with such anomalous electron transport.

[1] V. I. Demidov, S. M. Finnegan, M. E. Koepke and E. W. Reynolds, Contrib. Plasma Phys. 44, 689 (2004).
[2] Y. Raitses, A. Smolyakov and I. Kaganovich, from 34th International Electric Propulsion Conference, Kobe, Japan, 2015.

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