Abstract Submitted
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Cross-field electron transport inside an insulating cylinder of a baffled probe.[1] YEVGENY RAITSES, ANDREW ALT, Princeton Plasma Phys Lab — Plasma-immersed wall experiments have been performed in a magnetized xenon plasma in a cross-field Penning configuration with density around 10^{12} cm^{-3} and an electron temperature around a few eV. A cylinder with an open end and diameter of 1.4 mm was placed across field lines so that electrons were blocked from reaching a wire recessed behind the shield while ions were unimpeded. The reduction of electron current to the wire causes it to float closer to the plasma potential, possibly making a device that can passively measure plasma potential. However, the measured electron current was much higher than expected even when the wire was recessed several electron gyroradii behind the baffle. Possible mechanisms for this electron conduction causing the short circuiting to the bulk plasma have been studied with numerical approaches and with a dedicated experiment designed to isolate this short circuit effect. The obtained results may be important for cross-field transport in a variety of other configurations in magnetized, low-temperature plasmas.

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