

Abstract Submitted
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Measuring fluctuation-driven Poynting flux and dynamo EMF in a reversed-field pinch plasma¹ DEREK THUECKS, Washington College, KARSTEN MCCOLLAM, University of Wisconsin - Madison — In a reversed-field pinch driven by a toroidal electric field, the equilibrium profile is sustained by a net fluctuation-induced dynamo EMF. Coherent fluctuations in electric and magnetic fields also result in an outwardly-directed Poynting flux. In the experiments reported on here, insertable edge probes are used to measure the dynamo EMF and Poynting flux associated with these coherent fluctuations. Our results indicate that this outward flux is a significant fraction of the total input power, peaking during discrete magnetic relaxation events (or sawtooth crashes). The flux reaches a maximum near the magnetic reversal surface, suggesting that electromagnetic energy is deposited there. The dynamo EMF measured in the edge balances Ohm's law. As measurements are made at deeper insertions, the dynamo term changes sign as predicted, though the transition occurs closer than expected to the magnetic reversal surface.

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