

Abstract Submitted
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Investigation of Active Feedback Control of Turbulent Transport in a Magnetized Laboratory Plasma¹ SHUANGWEI XIE, MARK GILMORE, CHRISTOPHER WATTS, LINCAN YAN, ALAN LYNN, University of New Mexico, ANDREW WARE, University of Montana, CHAOUKI T. ABDALLAH, University of New Mexico — Toroidal fusion devices now generate transport barriers where heat and particle transport are reduced below Bohm diffusion levels. However, minimal particle transport may lead to such negative effects as core impurity accumulation or alpha particle buildup in a reactor. To reduce this kind of effect, active feedback control over cross-field transport is investigated in the new HELCAT (HELicon-CATHode) linear device at UNM. Sheared ExB flows, generated via biased concentric rings, are utilized to modify the transport. Fluctuations and flux are monitored with probe arrays. Open loop experiments have demonstrated that drift fluctuations can be fully suppressed by simple biasing, though the physical mechanism remains unclear, since no azimuthal flow shear appears to be present. Additionally, a 1D transport code is being used to model the system and investigate possible control methods numerically. Initial experimental and modeling results will be presented.

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