

Abstract Submitted
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Measurements of plasma potential with a heavy ion beam probe, and momentum transport in improved confinement RFP discharges¹ D.R. DEMERS, Xantho Technologies, P.M. SCHOCH, Rensselaer Polytechnic Institute, P.J. FIMOGNARI, V.V. MIRNOV, University of Wisconsin - Madison — Spatially localized measurements of the electric potential with a heavy ion beam probe (HIBP) in the interior of improved confinement reversed-field pinch plasmas indicate positive potentials ~ 1 -1.5 kV which decrease as a function of time. This suggests a mitigated loss of electrons due to reduction of magnetic stochasticity. The potential magnitude loosely tracks the dominant magnetic mode ($m=1$, $n=6$) velocity (flow); dependencies on profiles of T_e , T_i , and n_e are also speculated. Ambipolarity constraints on stochastic particle transport predict an outwardly directed electric field which couples to momentum balance (but fluid stresses have also been measured to be large). These issues are essential to understanding particle and momentum transport, yet there is not a good explanation for the origin of rotation in ohmically heated RFP plasmas. We will present initial investigations of these issues using a combination of theory, modeling, and HIBP measurements.

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