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Dynamic Heavy Ion Beam Probe Measurements in the Madison Symmetric Torus¹ D.R. DEMERS, X. CHEN, K.A. CONNOR, P.M. SCHOCH,

Rensselaer Polytechnic Institute, S.Y. ZHANG, University of Wisconsin - Madison — The Heavy Ion Beam Probe in operation on the Madison Symmetric Torus is now utilizing two new diagnostic features. The first is a programmable computerized control system which is enabling measurements in plasmas with gradual, deliberate equilibrium variations such as those which occur during improved confinement discharges. The system tracks dynamic equilibria using tailored temporal adjustments of the sweep and analyzer voltages; the primary goal of the system is to enable continuous measurements and the secondary goal is to maintain fixed sample volume locations. The second new diagnostic feature is an aperture which facilitates inference of the secondary beam position and velocity. This information, combined with the velocity and location of the primary ion beam as it enters the plasma, is useful as a constraint for magnetic equilibrium reconstruction. The accuracy of magnetic equilibria impacts HIBP sample volume localization, size, and orientation calculations, which in turn effect electric field and wavenumber measurements. Data acquired with, and overviews of the computerized control system and beam velocity aperture will be presented.

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Diane Demers
Rensselaer Polytechnic Institute

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