

Abstract Submitted  
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**Characterization of the Heavy Ion Beam Probe ion trajectory and sample volume in the MST RFP**<sup>1</sup> P.J. FIMOIGNARI, J.K. ANDERSON, J.A. REUSCH, Univ. of WI - Madison, D.R. DEMERS, X. CHEN, Rensselaer Polytechnic Institute — Operation of an HIBP on MST is complicated by temporal and spatial variations of the beam trajectory and sample volume. The foremost contributors are the uncertainty and temporal changes of the equilibrium magnetic field, throughout a sawtooth cycle in standard discharges, or with edge current drive during improved confinement discharges. Other contributors include edge magnetic field errors, plasma suppression structure magnetic fields, and magnetic mode activity. Accurate modeling of each feature is crucial to sample volume shape and localization calculations used for the analysis of equilibrium plasma potential and fluctuations in electron density and potential. A finite element model of the primary and secondary beamline electrostatic sweep systems has also been developed. This simulation also enables studies of finite-cross-section beams and associated scrape-off effects. An overview of the HIBP system on MST and in-depth spatial and temporal characterization of the trajectory and sample volumes will be presented.

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