

Abstract Submitted  
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**Integration of the Design of the Heavy Ion Beam Probe Diagnostic with the Wendelstein 7-X Stellarator Facility**<sup>1</sup> T. P. CROWLEY, D. R. DEMERS, P. J. FIMOGNARI, Xantho Technologies, LLC, Madison, WI, O. GRULKE, Max-Planck-Institute for Plasma Physics, Greifswald, Germany and Technical University of Denmark, Department of Physics, PPF, DK-2800 Lyngby, Denmark, R. LAUBE, H. TRIMINO MORA, Max-Planck-Institute for Plasma Physics, Greifswald, Germany — A heavy ion beam probe (HIBP) diagnostic is being designed for the Wendelstein 7-X (W7-X) stellarator. The diagnostic will be used to study equilibrium properties and turbulent transport through measurements of electric potential, fluctuations of electric potential and density, fluctuation wavenumbers, the cross-phase between fluctuations of density and potential, and electrostatic fluctuation induced particle flux. Recent efforts have emphasized the integration of the design with the W7-X facility. Successful integration is dependent on the locations of the 2 MeV accelerator, energy analyzer, and associated beamlines; the magnetic and vacuum properties of the HIBP hardware; and the system's compatibility with radiation safety requirements. Related work involves improvement in beam path and ion optics modeling, advancement of specification for the beam steering systems, deflectors, and focusing elements, and characterization of sub-system hardware. In addition, characterization and restoration of the 340 kV energy analyzer has been initiated. These tasks are key to preparing a cohesive HIBP design for the conceptual design review.

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