Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Expected performance and recent results from the X-ray Imaging Crystal Spectrometer on the W7-X stellarator NOVIMIR A. PABLANT, Princeton Plasma Physics Laboratory, ANDREAS LANGENBERG, Max-Planck-Institut für Plasmaphysik, MANFRED BITTER, LUIS DELGADO-APARICIO, DAVID A. GATES, KENNETH W. HILL, MICHAEL MARDENFELD, GEORGE H. NEILSON, Princeton Plasma Physics Laboratory — A new high resolution x-ray imaging crystal spectrometer diagnostic (XICS) has recently been installed on W7-X stellarator. This diagnostic will contribute to the study of ion and electron thermal transport and the evolution of the radial electric field by providing high resolution temperature and rotation measurements. The XICS diagnostic will provide spatially resolved profile measurements of the ion temperature (T_i), electron temperature (T_e), poloidal flow velocity (V_P) and impurity ion density for the Ar16+, Ar17+ and Fe24+ charge states. This system will have a maximum time resolution of 5ms, a spatial resolution of 2cm, and spatial coverage from the core to a normalized minor radius of $\rho \approx 0.8$. The system is fully installed and will be in operation for the initial W7-X experimental campaign (OP1.1). For this initial experimental campaign the XICS diagnostic will be the primary diagnostic for measurement of the core ion temperature and poloidal rotation. The design, expected performance and analysis techniques will be presented, along with any recent measurement results. Research supported by the U.S. DOE under Contract No. DE-AC02-09CH11466 with Princeton University.

Novimir A. Pablant
Princeton Plasma Physics Laboratory

Date submitted: 23 Jul 2015 Electronic form version 1.4