

Abstract Submitted
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Development of a Spatially Resolving X-Ray Crystal Spectrometer (XCS) for Measurement of Ion-Temperature (Ti) and Rotation-Velocity (v) Profiles in ITER¹ K.W. HILL, M. BITTER, D. JOHNSON, R. FEDER, Princeton University PPPL, P. BEIERSDORFER, J. DUNN, K. MORRIS, LLNL, M. REINKE, Y. PODPALY, J.E. RICE, MIT PSFC, R. BARNSELY, ITER Organization, M. O'MULLANE, Univ. Strathclyde, S.G. LEE, NFRC, Korea Basic Science Institute — An imaging XCS is being developed as a US-ITER activity for Doppler measurement of Ti and v profiles of impurities (W, Kr, Fe) with ~ 7 cm ($a/30$) and 10 ms resolution in ITER; the instrument is modeled after the very successful imaging XCS on the C-Mod tokamak, which was developed through a PPPL-MIT collaboration and is a prototype for the ITER instrument. The imaging XCS uses a spherically bent crystal and 2d imaging x-ray detectors to achieve high spectral resolving power (>6000) in the horizontal dimension and spatial imaging vertically. Two XCS arrays will measure Ti and both poloidal and toroidal rotation velocity profiles. Simultaneous measurement of many spatial views permits tomographic inversion for determination of local parameters. The design of the ITER instrument, predictions of performance, and interesting measurements from C-Mod will be presented.

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