Abstract Submitted
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Imaging X-Ray Crystal Spectrometers (XCS) for Measurement of Ti and Flow-Velocity (v) Profiles in ITER[1] K.W. HILL, M. BITTER, L. DELGADO-APARICIO, D. JOHNSON, R. FEDER, N. PABLANT, PPPL, P. BEIERSDORFER, J. DUNN, K. MORRIS, E. WANG, LLNL, M. REINKE, Y. PODPALY, J.E. RICE, MIT PSFC, R. BARNSLEY, ITER, M.O. MULLANE, U Strathclyde, S.G. LEE, NFRC, Korea, Y. SHI, ASIPP, PRC — A US-ITER team is designing a spatially resolving XCS for Doppler measurement of ion temperature (Ti) and flow-velocity profiles of impurities (W, Fe) in ITER with ∼7 cm (a/30) spatial and 10-100 ms temporal resolution. The imaging XCS uses a spherically bent crystal and 2d pixel array 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 and predictions of its performance, as well as measurements and data analysis techniques for prototype instruments on the Alcator C-Mod and Chinese EAST tokamaks will be presented.

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Kenneth Hill
PPPL

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