

Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

3-D ECE imaging on KSTAR for enhanced understanding of MHD and transport physics¹ GUNSU S. YUN, WOOSUNG LEE, JAE-HYUN LEE, MINJUN CHOI, HYEON K. PARK, POSTECH, Pohang, Korea, CALVIN W. DOMIER, NEVILLE C. LUHMANN, JR., Univ. California, Davis, CA, KSTAR TEAM — The electron cyclotron emission imaging (ECE-I) system on the KSTAR, an advanced diagnostic tool for 2D visualization of MHD instabilities, has enabled the study of sawteeth [1], tearing modes, and edge-localized modes (ELMs) [2] in unprecedented detail with a broad spatial coverage (each of the two views $\sim 50\text{cm} \times \sim 15\text{cm}$ vertical \times radial) and a fast time resolution ($\sim 1 \mu\text{s}$). To further advance the diagnostic capability, a second ECEI system is being installed at a location toroidally separated from the first ECEI system by $1/16^{\text{th}}$ of the circumference. The combined ECEI systems will provide quasi-3D visualization of MHD instabilities and address many critical issues such as mode rotation (both poloidal and toroidal velocities) and toroidal nonuniformity (mode beating and localization of the fast crash) of the MHD instabilities. In addition to the MHD studies, other important diagnostic applications, such as pitch angle measurement, 3D heat transport in various time scales, and toroidal correlation of turbulent fluctuations, are envisioned.

[1] Yun et al., submitted to PRL.

[2] Yun et al., PRL 107 (2011)

¹Work supported by NRF of Korea contract under No. 20120005920 and US DoE under contract No. DE-FG-02-99ER54531.

Gunsu S. Yun
POSTECH, Pohang, Korea

Date submitted: 18 Jul 2012

Electronic form version 1.4