

Abstract Submitted  
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**Correlation Study of Fluctuation and Coherent Structure of  $T_e$  with the 2-D ECEI System on KSTAR**<sup>1</sup> M.J. CHOI, G.S. YUN, W. LEE, H.K. PARK, Postech, N.C. LUHMANN, JR., C.W. DOMIER, University of California, Davis, A.J.H. DONNÉ, FOM Institute of Plasma Physics — Correlation study of the electron cyclotron emission (ECE) has been routinely used to measure a low level mesoscale electron temperature fluctuation ( $\leq 1\%$ ) in tokamak plasmas [1, 2]. Application of the correlation technique to the 2-D ECEI system which has  $\sim 400$  independent channels in 2-D space is ideal for the simultaneous measurement of poloidal and radial correlations of the coherent structure as well as the mesoscale fluctuations. The KSTAR dual ECEI system, composed of two independent sets of detectors, is capable of decorrelating the thermal and electric noises between two detector sets, and therefore 2-D correlation analysis is possible. Correlated fluctuation level spectra over 2-D/3-D poloidal/radial space will be addressed and their spatial structures will be assessed in this study. In addition, effects of the plasma rotation (poloidal and toroidal) in determination of the correlation spectra are studied in conjunction with the required long integration time.

[1] S. Sattler and H. J. Hartfuss, Phys. Rev. Lett. 72, 5 (1994).

[2] A. E. White et. al., Phys. Plasmas 15, 056116 (2008).

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