Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Observation of Multiple Reconnections during Self-organization Process of High Temperature Fusion Plasma[1] H.K. PARK, Postech, B. TOBIAS, Princeton Plasma Physics Laboratory, M.J. CHOI, G.S. YUN, Postech, C.W. DOMIER, N.C. LUHMANN, JR., Univ. of California, Davis, T. MUNSAT, Univ. of Corolado, Boulder, A.J.H. DONNÉ, G.W. SPAKMAN, FOM Inst. of Plasma Physics, TEXTOR TEAM — Images of a high resolution 2-D Electron Cyclotron Emission Imaging (ECEI) diagnostic shows evidence of multiple magnetic reconnection processes during the internal disruption of a high temperature tokamak plasmas. The disruption induces magnetic self-organization of the toroidal plasma being accompanied by successive or simultaneous multiple layer reconnection. The degree of asymmetric deformation of the internal magnetic structure (m/n=1/1 mode) prior to temperature crash influences the outcome of the disruptive behavior. The observation is critical for the building block of first principle theoretical modeling of the sawtooth oscillation in current driven toroidal plasmas and the understandings can be applied to the impulsive disruptive behavior in flares of the solar, accretion disk and stellar coronae, Earth magnetospheric storms, and controlled fusion.

[1]Work supported by the NRF of Korea, the US DOE, the NWO of the Netherlands, and the EURATOM-FOM association.

G.S. Yun
Postech

Date submitted: 15 Jul 2011 Electronic form version 1.4