

Abstract Submitted  
for the DPP12 Meeting of  
The American Physical Society

**Investigation of internal magnetic structures and comparison with two-fluid equilibrium configurations in the multi-pulsing CHI on HIST** T. NAKAYAMA, T. HANAO, H. HIRONO, T. HYOBU, K. ITO, K. MATSUMOTO, Y. KIKUCHI, N. FUKUMOTO, M. NAGATA, University of Hyogo, T. KANKI, Japan Coast Guard Academy — Spherical torus (ST) plasmas have been successfully maintained by Muti-pulsing Coaxial Helicity Injection (M-CHI) on HIST. This research object is to clarify relations between plasma characteristics and magnetic flux amplifications, and to compare magnetic field structures measured in the plasma interior to a flowing equilibrium calculation. Two-dimensional magnetic probe array has been newly introduced nearby the gun muzzle. The initial result shows that the diverter configuration with a single X-point can be formed after a bubble burst process of the plasma. The closed magnetic flux is surrounded by the open magnetic field lines intersecting with the gun electrodes. To evaluate the sustained configurations, we use the two-fluid equilibrium code containing generalized Bernoulli and Grad-Shafranov equations which was developed by L.C. Steinhauer. The radial profiles of plasma flow, density and magnetic fields measured on the midplane of the FC are consistent to the calculation. We also found that the poloidal shear flow generation is attributed to ExB drift and ion diamagnetic drift. In addition, we will study temporal behaviors of impurity lines such as OV and OVI during the flux amplification by VUV spectroscopic measurements.

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Date submitted: 13 Jul 2012

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