Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Ion flow measurements during the rotating kink behavior of the central column in the HIST device S. YAMADA, T. YOSHIKAWA, S. HASHIMOTO, T. NISHIOKA, Y. KIKUCHI, N. FUKUMOTO, M. NAGATA, Univ. of Hyogo — Plasma flow is essentially driven in self-organization and magnetic reconnection process of compact spherical torus (ST) and spheromak in the helicity-driven systems. For example, when reversing the external toroidal field of ST, the direction not only of the plasma current but also of the toroidal ion flow is self-reversed during the formation of the flipped ST relaxed states. Mach probe measurement shows that the velocity of the ion flow reversed after the flip increases to about 20 km/s. We have been newly developing an ion Doppler spectrometer (IDS) system using a compact 16 or 64 channel photomultiplier tube (PMT) in order to measure the spatial profile of ion temperature and rotation velocity in the HIST device. The IDS system consists of a light collection system including optical fibers, 1 m-spectrometer and the PMT detector. The optical fibers covered with glass tubes are inserted into the plasma. The glass tubes can be rotated in the poloidal and the toroidal directions. The new IDS system will be applied to observations of ion temperature and plasma rotation in the flipped ST formation and in the MHD control of kinking behaviors of the central column by using the rotating magnetic field (RMF). Preliminary IDS results will be compared to those from Mach probe measurements in space.

Yusuke Kikuchi
University of Hyogo

Date submitted: 20 Jul 2007 Electronic form version 1.4