

Abstract Submitted
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Interaction of rotating helical magnetic field with the HIST spherical torus plasmas YUSUKE KIKUCHI, MASATO SUGAHARA, SATOSHI YAMADA, TATSUYA YOSHIKAWA, NAOYUKI FUKUMOTO, MASAYOSHI NAGATA, University of Hyogo — The physical mechanism of current drive by co-axial helicity injection (CHI) has been experimentally investigated on both spheromak and spherical torus (ST) configurations on the HIST device [1]. It has been observed that the $n = 1$ kink mode rotates toroidally with a frequency of 10-20 kHz in the \mathbf{ExB} direction. It seems that the induced toroidal current by CHI strongly relates with the observed rotating kink mode. On the other hand, it is well known that MHD instabilities can be controlled or even suppressed by an externally applied helical magnetic field in tokamak devices. Therefore, we have started to install two sets of external helical coils in order to produce a rotating helical magnetic field on HIST. Mode structures of the generated rotating helical magnetic field and preliminary experimental results of the interaction of the rotating helical magnetic field with the HIST plasmas will be shown in the conference.

[1] M. Nagata, et al., *Physics of Plasmas* **10**, 2932 (2003)

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