

Abstract Submitted
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Investigations of plasmoid reconnection in the presence of strong guide fields in CHI plasma start-up on HIST. MASAYOSHI NAGATA, AKIHIRO FUJITA, YOUHEI IBRAGI, TAKAHIRO MATSUI, YUSUKE KIKUCHI, NAOYUKI FUKUMOTO, University of Hyogo, TAKASHI KANKI, Japan Coast Guard — Plasmoid magnetic reconnections have been examined in the Coaxial Helicity Injection (CHI) experiments on HIST. Magnetic reconnections are required for the formation of closed flux surfaces in the transient-CHI start-up plasmas. So far, we have observed formation of plasmoids inside an elongated current layer to create the multiple X-points during the CHI process. According to the MHD simulation by F. Ebrahimi and R. Raman, the reconnection rate based on the plasmoid instability is faster than that by Sweet-Parker (S-P) model. To estimate the Lundquist number S number, we have measured spatial profiles of magnetic field strength, electron density and temperature in the current layer. In this meeting, we will present the effect of the guide (toroidal) magnetic field and mass (H, D and He) on the current layer thickness and reconnection rates of plasmoids. It is found that behavior of plasmoids is synchronized with Ion Doppler temperature, leading to ion heating.

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