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Propagation of magnetic fluctuation driven by plasmoid reconnection in HIST-CHI experiments MASAYOSHI NAGATA, HIDEAKI MIYAMOTO, YOUHEI IBARAKI, University of Hyogo, TAKASHI KANKI, Japan Coast Guard Academy, YUSUKE KIKUCHI, NAOYUKI FUKUMOTO, University of Hyogo, HIST TEAM — Multiple plasmoid reconnection required for the flux closure in the transient-coaxial helicity injection (T-CHI) start-up process has been demonstrated in the Helicity Injected Spherical Torus (HIST) device. Two or three plasmoids are generated after the tearing instability of an elongated Sweet-Parker current sheet during the T-CHI. Here, we report that in the T-CHI start-up plasmas (H, D and He) with the strong toroidal (guide) field ($I_{\rm TF}$ =140 kA), (i) the frequency of regular oscillations of reconnecting magnetic field decreases as the mass number increases, i.e., 250 kHz (H), 150 kHz (D) and 60 kHz (He). (ii) the fluctuation propagates radially with 30 km/s (H), 20 km/s (D) and 12 km/s (He) from $R = 0.25$ m at the X-point toward the outboard side. It has been found that the propagation speed agrees with the Alfven speed. The small-size plasmoids cannot move radially and are staying between the elongated current sheet. Consequently, the plasmoid reconnection could be related to the excitation of Alfven wave, leading to the ion heating in the T-CHI discharge.

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