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Measurements of Doppler-ion temperature and flow in the multi-pulsing CHI experiment on HIST T. HANAO, M. ISHIHARA, H. HIRONO, T. HYOBU, K. ITO, K. MATSUMOTO, T. NAKAYAMA, Y. KIKUCHI, N. FUKUMOTO, M. NAGATA, University of Hyogo — The steady-state current sustainment of spherical torus (ST) configurations is expected to be achieved by Multi-pulsing Coaxial Helicity Injection (M-CHI) method. In the double-pulsing discharges, the plasma current can be sustained much longer against the resistive decay compared to the single CHI. The M-CHI has capabilities as a static ion heating method. Ion Doppler Spectrometer (IDS) measurements confirmed a significant increase in the ion temperature after the second CHI pulse. The ion heating mechanism is an important issue to be explored in the M-CHI experiments. It is considered due to the magnetic reconnection process of plasmoids and/or the damping of the Alfven wave. The ion heating becomes suppressed around the separatrix layer in the high field side where the amplitude of the magnetic fluctuations is minimized due to the poloidal flow shear. The shear flow generation is caused by ExB drift and ion diamagnetic drift. The contribution from the diamagnetic drift on the shear flow can be evaluated by measuring the flow velocity of hydrogen and impurity ions by using Mach probe and IDS. We will discuss the dependence of the ion heating characteristics on the variation of the density gradient by varying TF coil current.

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