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Floating Potential Measurement for High Guide Field Magnetic Reconnection in the UTST Tokamak Merging Experiment KOTARO YAMASAKI, SHIZUO INOUE, the University of Tokyo, SHUJI KAMIO, National Institute for Fusion Science, TAKENORI WATANABE, ANQI WANG, XUEHAN GUO, HIROKI ISHIKAWA, TOMOHIKO USHIKI, HIROKI NAKAMATA, TAKUMICHI SUGAWARA, KEITA MATSUYAMA, NAOTO KAWAKAMI, the University of Tokyo, TAKUMA YAMADA, Kyusyu University, MICHIAKI INOMOTO, the University of Tokyo, FRANK CHENG, National Cheng Kung University, YASUSHI ONO, the University of Tokyo — Langmuir probe measurements revealed a clear quadrapole structure of floating potential around the X-point in the UTST tokamak merging experiment with high toroidal (guide) magnetic field (typically Bt/Brec >10). The 2D profile of floating potential starts forming quadrapole structure and it is most emphasized when the reconnection speed reaches the maximum. Also using magnetic field measurements, we measured the electric field component parallel to the magnetic field (E||) around the X-point. It was observed that E||grows up inside the sheet with 4cm thickness only during the fast reconnection. This result indicates that the thickness of diffusion region is about half of the ion skin depth under the strong guide field. Those measurements were made under three different guide field and the fixed value of reconnecting magnetic field. With increasing the guide field, the length of magnetic field line inside the diffusion region increases, causing localized heating of electrons at the X-point. This result agrees well with the recent reconnection experiment at MAST and also with the recent PIC simulation.

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