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Localized Electron Heating by Strong Guide-Field Magnetic Reconnection[1] XUEHAN GUO, TAKUMICHI SUGAWARA, MICHIAKI INOMOTO, KOTARO YAMASAKI, YASUSHI ONO, The University of Tokyo, UTST TEAM — Localized electron heating of magnetic reconnection was studied under strong guide-field (typically $B_t \sim 15B_p$) using two merging spherical tokamak plasmas in Univ. Tokyo Spherical Tokamak (UTST) experiment. Our new slide-type two-dimensional Thomson scattering system documented for the first time the electron heating localized around the X-point. The region of high electron temperature, which is perpendicular to the magnetic field, was found to have a round shape with radius of 2 [cm]. Also, it was localized around the X-point and does not agree with that of energy dissipation term $E_t \cdot j_t$. When we include a guide-field effect term $B_t/(B_p+\alpha B_t)$ for $E_t \cdot j_t$ where $\alpha = \sqrt{(v_{in}^2 + v_{out}^2)/v_{\parallel}^2}$, the energy dissipation area becomes localized around the X-point, suggesting that the electrons are accelerated by the reconnection electric field parallel to the magnetic field and thermalized around the X-point.

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