R008-12
C 会場 ：9/25　PM2 （15:45-18:15）
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Microscale fluctuations in a magnetic island in collisionless reconnection

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Magnetic reconnection is a fast magnetic energy releasing process. It is widely observed in space and laboratory plasma such as solar flares, CME, substorms, tokamak devices etc. In the process of magnetic reconnection, magnetic energy is converted into the thermal and kinetic energy of plasma. When there are two or more X-points, magnetic island is formed. Inside a magnetic island one can often observe nonthermal particles as well as a variety of electromagnetic fluctuations. The origin of microstructures and nonthermal particles in a magnetic island has not been fully understood and extensively studied by using numerical simulations.

We conducted 2d PIC simulations of magnetic reconnection without guide field using periodic boundary conditions. The system size is L_X∗L_Y=25.6d_i∗12.8d_i in which two Harris current sheets are distributed along Y=L_Y/4 and Y=(3L_Y)/4. We focus only on the lower half system, $0 \leq$ L_Y $\leq$ 6.4d_i, hereafter. Ion to electron mass ratio is m_i /m_e=100, and the ratio between the background density and current sheet density n_b /n_0=0.2, initial temperature ratio T_i /T_e= 4 for both background and current sheet particles.A perturbation of magnetic flux is added in an initial Harris sheet condition to trigger a reconnection at (X, Y) = (0, 3.2d_i). In the development of magnetic island, micro-scale fluctuations are grown along the current sheet. We focus them here and their generation mechanism is discussed by carefully estimating parameters of local plasma. The result here is compared with the micro-fluctuations observed by Lu et al. (2011).