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Electron holes in PIC Simulations with Physical Mass Ratio GIOVANNI LAPENTA, KU Leuven, MARTIN GOLDMAN, DAVID NEWMAN, University of Colorado, ANDREY DIVIN, KU Leuven, S. MARKIDIS, UIUC — Numerical simulation of reconnection with the kinetic approach is presented. Calculations are performed using the implicit particle-in-cell code PARSEK. The initial configuration is taken to be a conventional Harris current sheet with a guide field and an initial X-point perturbation is superposed to drive the reconnection process. The simulations reproduce such typical features as the Hall structure, the plasma exhaust jets and particle acceleration near X-point. Our attention is focused on the study of kinetic processes near the separatrix. Fast electron flows formed by Hall current system are favourable for development of electrostatic instabilities (namely, electron-ion Buneman instability) [Pritchett, 2005], [Goldman, 2008] as electrons stream much faster than ions there. The distribution functions are investigated for the evidence of electron holes formed by the Buneman instability and the corresponding bipolar spots of electric field. The relation between those reconnection signatures and development of separatrix instability in simulations is discussed.

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