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**Energy conversion in the asymmetric reconnection diffusion region** SHAN WANG, LI-JEN CHEN, NAOKI BESSHO, University of Maryland College Park, Goddard Space Flight Center, MICHAEL HESSE, University of Bergen, Norway, MMS TEAM — The energy conversion in the diffusion region during asymmetric reconnection is studied using two-dimensional particle-in-cell (PIC) simulations. The energy partition is region-dependent and varies with the guide field strength. Without a guide field, within the central electron diffusion region, the input magnetic energy is mostly converted to electron thermal energies; half of the input energy to the region from the X-line to the peak ion outflow location is converted to the plasmas energy, with approximately equal partition between ions and electrons, similar to the laboratory results from the Magnetic Reconnection Experiment (MRX); over the entire ion diffusion region, about half of the energy goes to ions, and 20% goes to electrons. Electrons obtain energies mainly from the reconnection electric field ($E_r$), while the in-plane electrostatic fields ($E_{in}$) have a net negative contribution. For the ion total energy gain in the diffusion region, about 2/3 is from $E_{in}$ and 1/3 is from $E_r$. Adding a guide field tends to reduce the plasmas energy gain. The energy partition in the diffusion region observed by the Magnetospheric Multiscale (MMS) Mission will be estimated and compared with the PIC and MRX results.

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