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Is there a fundamental principle for energy partitioning in a proto-typical reconnection layer?[1] MASAAKI YAMADA, JONGSOO YOO, RUSSELL KULSRUD, Princeton Plasma Physics Laboratory, Princeton University — Recently, a quantitative inventory of magnetic energy conversion in a proto-typical reconnection layer was experimentally studied in MRX with a well-defined boundary [1,2]. This study concluded that about half the inflowing magnetic energy is converted to particle energy, while more energy is partitioned to ions. This observation was found to be consistent with numerical simulation results based on VPIC codes [3]. It was also found that features of energy conversion and partitioning do not strongly depend on the size of the analysis region. A question arises, whether there is a fundamental principle in the energy partitioning in a proto-typical reconnection layer. This talk presents our physics analysis of the energy conversion processes in the magnetic reconnection layer of two-fluid physics regime. The flows of electrons at the reconnection layer lead to a formation of strong electrostatic field in the reconnection plane causing ion acceleration and resultant ion heating. Based on the two-fluid features, a quantitative analytical model of energy partitioning will be presented. [1] M. Yamada et al, Nature Communications. **5**, 4774 (2014) [2] M. Yamada et al, Phys. Plasmas, **23**, 055402 (2016) [3] K.J. Bowers et al, Phys. Plasmas, **15**, 055703 (2008)

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