

Abstract Submitted  
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**Physical Picture of Quadrupole Magnetic Field and Electrostatic Potential in 2D Magnetic Reconnection** CHIO Z. CHENG<sup>1</sup>, SHIZUO INOUE, YASUSHI ONO, University of Tokyo, Japan, RITOKU HORIUCHI, National Institute for Fusion Science, Japan — We will present the physical picture of how the quadrupole magnetic field and the electrostatic potential are generated during reconnection of merging magnetic fields in 2-dimensional (poloidal) plane. The physical pictures are obtained based on 2-1/2 dimensional collisionless particle simulations using the PASMO code<sup>2</sup> and theoretical calculations. The physical picture is different from the one presented by Uzdensky and Kulsrud.<sup>3</sup> We will describe the physical picture of the reconnection process from the current sheet formation, to the initial reconnection in the electron current sheet and then the expansion of reconnection layer to the ion current sheet. In particular, we will provide the physical mechanism of how the poloidal current (including the Hall current in the downstream region) is generated and how the electrostatic potential is produced in the poloidal plane.

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<sup>2</sup>H. Ohtani and R. Horiuchi, Plasma Fusion Res, 4, 024 (2009).

<sup>3</sup>D. A. Uzdensky and R. M. Kulsrud, Phys. Plasma, 13, 062305 (2006).

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