

Abstract Submitted  
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**Reconnection properties in Hall MHD Plasmas**<sup>1</sup> ZHI-WEI MA, XING-QIANG LU, YA-WEI HOU, Zhejiang University — Dynamics and properties of magnetic reconnection with an asymmetry initial condition are studied by using Hall MHD simulation. In the early phase of the magnetic reconnection, the geometry of the magnetic field in the near reconnection region tends to form a Y-type structure under an asymmetry initial condition instead of to exhibit an X-type structure in the symmetry initial condition. The growth rate of the current density in the early stage is proportional to the square of the ion inertial length. In the late phase, the thin elongated current sheet associated with the Y-type geometry of the magnetic field breaks-up to form a magnetic island due to the secondary tearing instability. It is found that the onset time of the secondary tearing instability is inversely dependent on the square root of the ion inertia length. The generated Hall electric field and net charge are larger in the region inside than outside the magnetic island. The strengths of the Hall electric field and net charge density linearly increase with the increase of the ion inertia length.

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