Abstract Submitted
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Development of high-resolution two-dimensional magnetic field measurement system by use of printed-circuit technology[1] MOE AKIMITSU, CAO QINGHONG, ASUKA SAWADA, HIRONORI HATANO, HIROSHI TANABE, YASUSHI ONO, Graduate School of Frontier Sciences, TS-GROUP TEAM — We have developed a new-types of high-resolution magnetic probe array for our new magnetic reconnection experiments: TS-3U (ST, FRC: R=0.2m, 2017-) and TS-4U (ST, FRC: R=0.5m, 2018-), using the advanced printed-circuit technology. They are equipped with all three-components of magnetic pick-up coils whose size is 1-5mm x 3mm. Each coil is composed of two-sided coil pattern with line width of 0.05mm. We can install two or three printed arrays in a single glass (ceramic) tube for two or three component measurements. Based on this new probe technique, we started high-resolution and high-accuracy measurement of the current sheet thickness and studied its plasma parameter dependence. We found that the thickness of current sheet increases inversely with the guide toroidal field. It is probably determined by the ion gyroradius in agreement with the particle simulation by Horiuchi etc. While the reconnection speed is steady under low guide field condition, it is observed to oscillate in the specific range of guide field, suggesting transition from the quasi-steady reconnection to the intermittent reconnection. Cause and mechanism for intermittent reconnection will be discussed using the current sheet dissipation and dynamic balance between plasma inflow and outflow.

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