

Galileo 衛星による木星磁気圏尾部リコネクションの観測 Galileo observations of Jovian tail reconnection

笠原 慧^{1*}, Elena Kronberg², 木村 智樹¹, 埜 千尋¹, Sarah Badman¹

KASAHARA, Satoshi^{1*}, Elena Kronberg², KIMURA, Tomoki¹, TAO, Chihiro¹, Sarah Badman¹

¹ 宇宙科学研究所, ² Max Planck Institute

¹ISAS/JAXA, ²Max Planck Institute

Magnetic reconnection in planetary magnetospheres plays important roles in energy and mass transfer in the steady state, and also possibly in transient large-scale disturbances. Our detailed case study has shown that a reconnection jet front in Jovian magnetotail was associated with the front thickness of the order of ion inertial length, sub-Alfvenic ion flow, density depletion, and particle energisation. Although these characteristics are similar to the terrestrial jet fronts, their generality in the Jovian magnetosphere has not been clarified, since the above result was based on a single event study. Therefore we examined strong north-south magnetic field events in the Jovian outer magnetosphere. Through the analyses with plasma velocity and density data, we found the clear dawn-dusk asymmetry; both northward and southward magnetic events in the dawn side show reconnection jet front signatures (tailward and sunward propagating, respectively), whereas dusk side events do not. This result suggests that the Jovian tail X-line is absent in the dusk side or located much further down tail compared to the dawn side.

Keywords: Jovian magnetosphere, tail reconnection