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地球磁気圏尾部及び太陽コロナにおける粒子加速の比較研究
Comparison study of particle acceleration in the Earth's magnetotail and solar corona

今田 晋亮 [1*], 平井 真理子 [2], 磯部 洋明 [3], 渡邉 恭子 [4], 岡光夫 [5], 簑島 敬 [6]
Shinsuke Imada[1*], Mariko Hirai[2], Hiroaki Isobe[3], Kyoko Watanabe[4], Mitsuo Oka[5], Takashi Minoshima[6]

[1] 名古屋大学太陽地球環境研究所, [2] 東京大学大学院理学系研究科地球惑星科学専攻, [3] 京都大学宇宙総合学研究ユニット, [4] 宇宙航空研究開発機構　宇宙科学研究所, [5] カリフォルニア大学バークレー校　宇宙科学研究所, [6] 海洋研究開発機構地球内部ダイナミクス領域
[1]Solar-Terretrial Environment Laboratory, Nagoya University, [2]Department of Earth and Planetary Science, School of Science, University of Tokyo, [3]Unit of Synergetic Studies for Space, Kyoto University, [4]Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, [5]Space Sciences Laboratory, UC Berkeley, [6]Institute for Research on Earth Evolution, Japan Agency for Marine-Earth Science and Technology

One of the most famous rapid energy conversion mechanisms in space is a magnetic reconnection. The general concept of a magnetic reconnection is that the rapid energy conversion from magnetic field energy to thermal energy, kinetic energy or non-thermal particle energy. The understanding of rapid energy conversion rates from magnetic field energy to other energy is the fundamental and essential problem in the space physics. One of the important goals for studying magnetic reconnection is to answer what plasma condition/parameter controls the energy conversion rates. Earth's magnetotail has been paid much attention to discuss a magnetic reconnection, because we can discuss magnetic reconnection characteristics in detail with direct in-situ observation. Recently, solar atmosphere has been focused as a space laboratory for magnetic reconnection because of its variety in plasma condition. So far considerable effort has been devoted toward understanding the energy conversion rates of magnetic reconnection, and various typical features associated with magnetic reconnection have been observed in the Earth's magnetotail and the solar corona.

In this talk, we first introduce the variety of plasma condition/parameter in solar corona and Earth's magnetotail. Later, we discuss what plasma condition/parameter controls the energy conversion from magnetic field to especially non-thermal particle. To compare non-thermal electron and ion acceleration in magnetic reconnection, we used Hard X-ray (electron) /Neutron monitor (ion) for solar corona and Geotail in-situ measurement (electron and ion) for magnetoatil. We found both of electron and ion accelerations are roughly controlled by reconnection electric field (reconnection rate). However, some detail point is different in ion and electron acceleration. Further, we will discuss what is the major difference between solar corona and Earth's magnetotail for particle acceleration.

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