

PEM024-05

Room: Function Room A

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Evaluation of various substorm models

Shinobu Machida^{1*}, Yukinaga Miyashita², Akimasa Ieda²

¹Div. Earth & Planetary Sci., Kyoto Univ., ²STE Lab., Nagoya Univ.

As one of the most difficult issues in the magnetospheric physics, the issue how substorms are triggered and maintained, still remains unsolved. There are many substorm models such as (1) Near-Earth Neutral Line model, (2) Current Disruption model, (3) Ballooning model, (4) Thermal Catastrophe model, (5) Boundary Layer model, (6) M-I Coupling model (Kan version), (7) M-I Coupling model (Tanaka version), (8) Flow Braking model, (9) Flux-Tube Content Reduction model, (10) AKR Triggering model, (11) Catapult Current Sheet Relaxation model etc. However, it is not necessarily possible to explain the variations in the magnetosphere and the ionosphere during substorms by adopting one particular model proposed so far. The physical mechanism of substorm tends to be discussed being focused on the issue of triggering in these days. However, it is necessary to discuss including the mechanisms which derive and maintain the substorm. In this regard, we evaluate each model of substorm by examining its advantage and disadvantage to find the final and complete model of substorm. We also discuss on the most effective way to perform various kinds of observations to confirm the validity of the substorm model.

Keywords: magnetosphere, substorm, magnetic reconnection, current disruption, aurora