

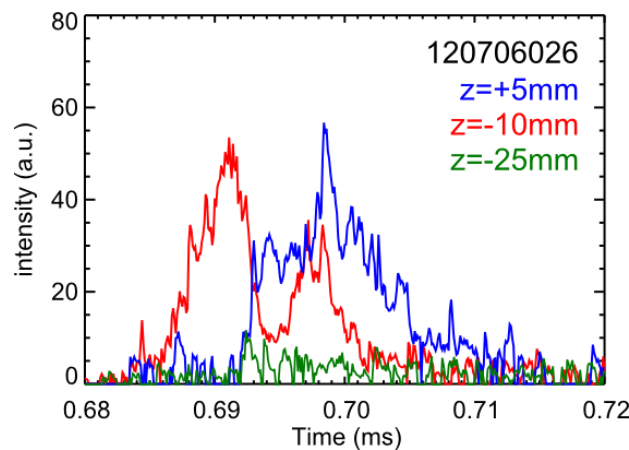
高ガイド磁場下における磁気リコネクションの研究  
**Studies of Magnetic Reconnection in the Presence of Strong Guide Field**

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Magnetic reconnection is a well-known phenomenon in magnetized plasmas in the fields of solar physics and earth's magnetospheric research. When the magnetic field lines reconnect, the magnetic energy in the upstream region is mainly converted to the plasma kinetic energy in the downstream region. In the presence of strong guide field, the electrons are more likely to be accelerated in the guide field direction near the X-point. When the strong guide field exists, the electron current in the diffusion region is less likely to be scattered by the reconnected poloidal magnetic field and be accelerated effectively by the reconnection electric field [1].

In the previous review, the existence of the accelerated electrons is indicated by the observation of the He II line emission near the X point [2]. The emission was observed only in the vicinity of the X point, however, in the recent detail verification, the emission is not from the X point strictly. In addition, the electric field peak timing was different from the emission intensity peak timing. In order to solve these problems, we verified the electron motion by making an electron acceleration model including the drift effect.



- [1] E.N. Parker, *J. Geophys. Res.* **62**, 509 (1957)  
 [2] S.Kamio *et al.*, *IEEJ Trans. FM* **133**, 4, pp 166-172 (2013)