M23a COLLISIONLESS RECONNECTION IN IMPULSIVE SOLAR FLARES

SOMOV, Boris（国立天文台、モスクワ大学）、小杉 健郎、坂尾 太郎（国立天文台）

Two sub-classes of the impulsive solar flares, observed with the HXT on board *Yohkoh*, have been discovered by Sakao *et al.* (1997). The two sub-classes can be characterized as *more impulsive* (MI) and *less impulsive* (LI) flares, respectively. We assume that, in both sub-classes, the 3D reconnection process occurs at the separator with a longitudinal magnetic field. The high-temperature turbulent-current sheet (HTTCS), placed along the separator, generates fast outflows of 'super-hot' plasma and accelerated particles.

The difference between the MI and LI flares presumably appears because in the MI flares the collisionless reconnection process goes with a decrease of the longitudinal magnetic field, which is parallel to the electric current in the HTTCS. On the contrary, in the LI flares the reconnection proceeds with an increase of the longitudinal field. An effective compressibility of plasma with the frozen-in longitudinal field in the vicinity of the HTTCS becomes smaller and smaller; that is why the reconnection rate is lower in the LI flares.

Since reconnection in the MI flares proceeds with a decrease of the longitudinal field, the reconnected field lines becomes shorter in this process. When the reconnected field lines become shorter and shorter, heat conductive fluxes along them arrive at the upper chromosphere faster. So, in the MI flares the chromospheric evaporation begins earlier than in the LI flares. The evaporation process switches off the accumulation of 'super-hot' plasma in the MI flares. In the LI flares, an observable amount of 'super-hot' plasma can be accumulated.