[S5-3] Kinematic Properties of Flare-Associated X-ray Plasma Ejections

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Many flare-associated X-ray plasma ejections (XPEs) have been observed by the Soft X-ray Telescope aboard Yohkoh. In our previous study, we identified 137 XPEs from 279 limb flares from 1999 April to 2001 March and examined the association between the XPEs and the CMEs. As a result, we found that the XPEs are highly associated with the CMEs but the expanding fronts of XPEs do not correspond to the early signatures of their associated CMEs in the low corona. In this study, we present the kinematic properties of XPEs and compare them with those of CMEs as follows. Firstly, it is found that the XPE velocity ranges from 30 km/s to 1300 km/s with the mean value of about 230 km/s; a large fraction of the events (about 68 %) have smaller speeds than 200 km/s. In the case of their associated CMEs, the CME speed ranges from 150 km/s to 2000 km/s with the mean value of about 530 km/s; most of the events are in the range of 200 to 600km/s. Secondly, when we make height-time plots for several selected events, we found that while the CME speeds have some correlations with X-ray flux curve, the XPE speeds do not. Thirdly, we also found that there is little correlation between the XPE speeds and the CME speeds. These facts imply that the height-time evolutions of XPEs and CMEs are quite different. Some possible relationships between the XPEs and the CMEs are also discussed in terms of their kinematic properties.

[S5-4] Flare-Associated Coronal Mass Ejections having Large Accelerations

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It is well known that while flare-associated coronal mass ejections (CMEs) show higher speeds and little accelerations in the high corona, filament-associated CMEs have lower speeds and large accelerations. In this paper, we examine three flare-associated CMEs having relatively large accelerations as counterexamples of the former tendency. The first event is the 1999 July 9 event associated with a C1.1 flare. Considering the fact that its CME appearance seen in the LASCO running difference imagery is quite similar to the shape of a helmet streamer, we speculate that its eruption is related to the destabilization of a helmet streamer, which may induce the weak X-ray flare. The second event is the 1999 August 17 event associated with a C2.6 flare. The CME speed abruptly increased from 232 to 909 km s^{-1} for an hour and the strong acceleration is coincident with the occurrence of another subsequent flare/CME. The third event is the 2000 November 24 event associated with an C4.1 flare. The CME speed firstly decreased and then was constantly accelerated for four hours. The starting of such an acceleration is also coincident with a subsequent CME/flare event. Our results show that large accelerations of flare-associated CMEs as counterexamples of the two classes of CMEs, seem to be caused by the disturbances of other solar activities such as helmet streamer disruptions or subsequent CMEs/flares.