

Associations of Coronal Mass Ejections as a function of X-ray Flare Properties

S. Yashiro (1,2), N. Gopalswamy (2), S. Akiyama (1,2), and R. A. Howard (3)

(1) The Catholic University of America, (2) NASA/GSFC, (3) Naval Research Lab.
(yashiro@ssedmail.gsfc.nasa.gov)

We examined the associations between coronal mass ejections (CMEs) and X-ray flares using data from the Large Angle Spectrometric Coronagraph (LASCO) on board the Solar and Heliospheric Observatory (SOHO). The CME association of 1540 X-ray flares (M class and above) detected by GOES satellite were examined. As reported in previous studies, the CME association rate clearly increased with the peak X-ray intensity, the total X-ray intensity, and the decay time. The CME association rate increased from 40% (flare size between M1.0 and M1.7) to 98% (flare size above X1.8). Except for an X3.6 flare on July 16, 2004, all the 50 huge flares (above X1.8) definitely have associated CMEs. Furthermore, all the X-ray flares with a decay time exceeding 90 min were associated CMEs. We discuss which X-ray parameters are essential in order to have CME association.