

Origin of a CME in the lower corona: a study of the 23 April 1998 event

Takashi Miyawaki[1], Satoshi Masuda[1]

[1] STEL, Nagoya Univ

We have investigated a CME occurred on 23 April 1998. In the lower corona an X-class flare occurred. During this flare, an expanding structure and a dimming were detected by SXT and EIT, respectively. But our conclusion is that they do not directly correspond to the main part of the CME.

We also detected a faint loop expanding outward around the time which is close to the time the CME started at the solar surface. However, the mass of this loop is quite small. This loop does not directly correspond the main part of the CME.

We could not find the counterpart of CME in the lower corona. In this analysis, we investigated limited ranges of temperature and spatial area. We need expand our study to utilize other complementary data in order to identify the origin of CMEs in the lower corona.

CMEs often take place accompanied by solar flares, but the physical relationship between them has not yet been understood.

We have investigated a CME which occurred on 23 April 1998, using Yohkoh/SXT, SOHO/EIT, and LASCO data. Initially, the CME front appeared in the field of view of LASCO at 05:27 UT and, in the lower corona an X-class flare occurred at 05:34 UT. During this flare, an expanding loop-like structure and a dimming were detected by SXT and EIT, respectively. We estimated the mass ejected in these two events to be rather small (10^{12} - 10^{13} g) compared with typical mass ejections (10^{14} - 10^{16} g) for a normal CME. Also, their onset times were somewhat late when compared to the time of appearance of the CME, so they do not directly correspond to the main part of the CME.

Using soft X-rays, we also detected a faint loop expanding outward around 4:00 UT. This is close to the estimated time when the CME started at the solar surface. However, the mass of this expanding loop is quite small (about 10^{10} g). This expanding loop does not directly correspond the main part of the CME even though it is somehow related to the CME.

We could not find the counterpart of CME in the lower corona. In this analysis, we investigated limited ranges of temperature (or wave-length) and spatial area. We need expand our study to utilize other complementary data in order to identify the origin of CMEs in the lower corona.