

[S08-2] **Pre-flare Activity of Four M-class Flares**

김수진^{1,2}, 문용재², 김연환², 조경석², 박영득², 김갑성¹
¹경희대학교, ²한국천문연구원

We have investigated pre-flare activity of four M-class X-ray flares using GOES X-ray, Yohkoh/SXT and TRACE EUV data. For this we considered all X-ray flares stronger than M1 class in 1999. We selected four disk events whose pre-flare activity in GOES X-ray curves and Yohkoh/SXT images are evident as well as whose SXT quiet mode data during the pre-flare activity are available. Their pre-flare activities are categorized into three types according to their spatial closeness between the pre-flare activity and the main flare activity: co-spatial(2), adjacent/overlapping(1), distant(1). We also examined the pre-flare activity in TRACE 1600 Å and 171 Å images for 2 events. Major results from this study are as follows : (1) all pre-flare brightenings occurred within 30 minutes before the starting times of the main flares, (2) They all happened in the same active regions in which the main flares occurred, mainly near the main flare kernels, (3) a closer look at the TRACE high resolution movie shows that there existed a small-scale sheared S-shaped loop at the brightening area of SXT loop footpoint and a subsequent eruption during the pre-flare activity. We are determining the physical properties of these pre-flare brightenings and are extending the above analysis to a large set of data.

[S08-3] **Comparison of Field Opening Observations with the Breakout CME Model**

봉수찬, 문용재, 조경석, 김연환, 박영득
 한국천문연구원

In our previous study, we reported direct SOHO/LASCO C1 observations of low coronal "magnetic breakout" (field opening) that occurred during the eruption of a coronal mass ejection (CME) on 1998 March 23. LASCO C1 images showed slow expansion and fast eruption of a coronal loop, and subsequent field opening. From these observations together with Yohkoh/SXT and SOHO/MDI images, we deduced the change of coronal magnetic field configuration during the eruption. In this study we present a more detailed analysis and in-depth comparison of the event with the "breakout" CME model in which the acceleration is initiated by magnetic reconnection on top of the overlying field. The comparison shows that, (1) the overall magnetic field configuration and evolution agrees with the breakout model, (2) we cannot determine whether the acceleration of CME front precedes that of underlying X-ray loop within observation cadence, (3) the acceleration began about 1 hour before field opening, which disagrees with initiation mechanism of the breakout model. This result shows that the main acceleration mechanism in this event is not "magnetic breakout", in terms of observed kinematics.