[구SO-05] Magnetic Reconnection seen in the X-type Intersection of Eruptive Kinked Loops

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We report on multi-wavelength observations of magnetic reconnections that occurred in the X-type intersection of erupting kinked loops associated with a coronal mass ejection (CME) on 2002 July 23. Such reconnections have been predicted from theoretical and numerical studies of kinked loops but never observed. We found for the first time EUV cusp-like brightenings at the intersecting X-type position of the kinked loops seen in EIT running difference images as evidence for magneticreconnection. Especially, the radioheliograms clearly show kink-unstable motions which include a counter-clock wise rotation at the angular speed of 18 degree/min for the first 20 minutes of its eruption. The EUV brightenings occurred just after about one rotation of the writhing loops. These facts support that the brightenings are caused by magnetic reconnection occurred in the X-type intersection of the kinked loops. Additional signatures supporting for the magnetic reconnection are as follows; (1) there was a weak GOES X-ray enhancement with a very short duration of about 1 minute just at the time of the EUV cusp-like brightenings, (2) the temperature of heated plasma estimated from the flux ratio of shorter and longer wavelengthflux of GOES is about 10 MK, and (3) the erupting kinked loops are intimately associated with a SOHO/LASCO CME seen at 05:06 in the LASCO C2 field of view. It is also noted that there were continuous EUV brightenings at the bottom of one footpoint of the kinked loops for a few hours after the reconnection.

[구SO-06] First Stereoscopic Determination of Heights of Coronal Bright Points Using EUVI aboard STEREO/SECCHI

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The heights of the coronal bright points (CBPs) were measured for the first time by us applying a stereoscopic method to image pairs obtained by SECCHI EUVI aboard STEREO. The CBPs were observed on 22 March 2008 in 171Å, 195Å, 284Å and 304 Å images. At that time, the separated angle between spacecrafts "Ahead" and "Behind" is about 49° and its corresponding measurement error is ±1.3 Mm. We have investigated the heights and morphological characteristics of CBPs using image pairs having two different line-of-sight directions. We found that the heights of CBPs above the photosphere (6.96×102 Mm) range from 2 Mm to 13 Mm and, more interestingly, are divided into two subgroups of heights depending on temperature where the filter response reaches a peak. The average height of CBPs taken on 171Å (Fe IX-X, T=1.3×106K), 304Å (He II, 8.0×104K) is about 6 Mm and the average height of CBPs taken on 195Å (Fe XII, T=1.6×106K) 284Å (Fe XV 2.0×106K) is about 8 Mm. We conclude that CBPs are small loop-like structures having heights between 2 Mm and 13 Mm above the solar photosphere. In addition, the CPBs may have cool (T< 1.3×106K) component and hot (T> 1.6×106 K) one with different heights of low (6 Mm) and high (8 Mm), respectively.