
[☉SS-18] Plasma Upflows and Microwave Emission in Hot Supra-arcade Structure associated with M1.6 Limb Flare

Sujin Kim^{1,2,3}, Kiyoto Shibasaki², Hazel M. Bain⁴, Kyung-Suk Cho¹

¹*Korea Astronomy and Space Science Institute*

²*National Astronomical Observatory of Japan*

³*Kyung Hee University*, ⁴*University of California Berkeley*

We have investigated a supra-arcade structure associated with an M1.6 flare, which occurred on the south-east limb in the 4th of November 2010. It is observed in extreme ultraviolet (EUV) with the Atmospheric Imaging Assembly (AIA) onboard the Solar Dynamics Observatory (SDO), microwaves at 17 and 34 GHz with the Nobeyama Radioheliograph (NoRH), and soft X-rays of 8–20 keV with the Reuven Ramaty High Energy Solar Spectroscopic Imager (RHESSI). Interestingly, we found exceptional properties of the supra-arcade thermal plasma from the AIA 131 Å and the NoRH: 1) plasma upflows along large coronal loops and 2) enhancing microwave emission. RHESSI detected two soft X-ray sources, a broad one in the middle of supra-arcade structure and a bright one just above the flare-arcade. We estimated the number density and thermal energy for these two source regions during the decay phase of the flare. In the supra-arcade source, we found that there were increases of the thermal energy and the density at the early and the last stages, respectively. On the contrary, the density and thermal energy of the source on the top of the flare-arcade decreases throughout. The observed upflows imply that there is continuous energy supply into the supra-arcade structure from below during the decay phase of the flare. It is hard to be explained by the standard flare model in which the energy release site is located high in corona. Thus, we suggest that the potential candidate as the energy source for the hot supra-arcade structure is the flare-arcade which has exhibited a predominant emission throughout.

[☉SS-19] Two-Ribbon Filament Eruption on 29 September 2013

Yeon-Han Kim, Su-Chan Bong, Jaejin Lee, Il-Hyun Cho, and Young-Deuk Park

Korea Astronomy and Space Science Institute

We have presented a classic two-ribbon filament eruption occurred in the east side of NOAA active region 11850 at 21:00 UT on 29 September 2013. Interestingly, this filament eruption was not accompanied by any flares and just there was a slight brightening in X-rays, C1.2, associated with the eruption. An accompanying huge CME was appeared at 22:12 UT in the LASCO C2 field of view and it propagates into the interplanetary space with a speed of about 440 km/s. And the related solar proton event (S2) started at 05:05 UT and peaked at 20:05 UT on 30 September 2013. The CME arrival was recorded by the ACE spacecraft around 01:30 UT on 2 October 2013. Around the CME arrival time, the solar-wind speed reached at about 640 km/s and IMF Bz showed southward component (–27 nT). Finally, the filament eruption and the CME cause geomagnetic storm (G2) at 03:00 UT on 2 October 2013. We described the detailed evolution of the filament eruption and its related phenomena such as CME, proton event, geomagnetic storm and so on. In addition, we will discuss about the activation mechanism of the filament eruption without flares.