

Confined Solar Flares observed by the Solar Dynamic Observatory

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Since coronal mass ejections (CMEs) are main cause of solar energetic particle events and geomagnetic storms, the CME forecasting is essentially important for the space weather. During 2011 February ? 2012 January, 21 major flares (\geq M5 level) occurred. We examined their association of coronal mass ejections (CMEs) by viewing the white light images obtained by the LASCO C2 and STEREO COR1 coronagraphs. We found that, out of the 21 major flares, four lacked the associated CMEs. The four confined flares were an M6.6 flare on 2011 February 18, an X1.5 flare on 2011 March 9, an M5.8 flare on 2011 September 24, and an X1.9 flare on 2011 November 3. We examined flare locations in the active region using the SDO/AIA and SDO/HMI data and found that each flare occurred at the center of the AR. We confirmed that the confinement by the overlying magnetic field is responsible for the confined major flares.