
Observations of Overlying Extreme-ultraviolet Arches confining the eruption of a Filament

Hua-Dong Chen^{*1}, Suli Ma², and Jun Zhang³

¹College of Science, China University of Petroleum – Changjiang Xi road 66, Economic and Technological Development Zone, Qingdao, 266580, China

²College of Science, China University of Petroleum – Changjiang Xi road NO.66, Economic and Technological Development Zone, Qingdao, 266580, China

³Key Laboratory of Solar Activity, National Astronomical Observatories, Chinese Academy of Sciences – Datun Road 20, Chaoyang District, Beijing, 100012, China

Abstract

Using the multi-wavelength data from the Atmospheric Imaging Assembly (AIA) onboard the Solar Dynamic Observatory (SDO), we report a failed filament eruption in NOAAAR11339 on 2011 November 3. This eruption was associated with an X1.9 flare, but without any distinct CME, coronal dimming or EUV wave according to the observations from SECCHI EUVI and COR1 onboard the spacecraft STEREO B. Some magnetic arcades above the filament was observed distinctly in EUV channels, especially in 94 Å and 131 Å, before and during the filament eruption process. Our results show that the overlying arcades expanded along with the ascent of the filament at first until they reached a projected height of about 49 Mm above the Sun's surface, where they stopped. The following filament material was observed to be confined by the stopped EUV arcades and not to escape from the Sun. These results support that the overlying arcades play an important role in preventing the filament to erupt outward successfully.

Keywords: Sun: activity, Sun: filaments, prominences, Sun: flares, Sun: rotation

*Speaker