Cornell University Library

We gratefully acknowledge supporting institutions

arXiv.org > astro-ph > arXiv:1107.1391

Search or Article-id (Help | Advanced search) All papers Go!

Astrophysics > Solar and Stellar Astrophysics

Three-Dimensional Reconstruction of an Erupting Filament with SDO and STEREO Observations

Ting Li, Jun Zhang, Yuzong Zhang, Shuhong Yang

(Submitted on 7 Jul 2011)

On 2010 August 1, a global solar event was launched involving almost the entire Earth-facing side of the Sun. This event mainly consisted of a C3.2 flare, a polar crown filament eruption and two Earth-directed coronal mass ejections (CMEs). The observations from the Solar Dynamics Observatory (SDO) and the Solar Terrestrial Relations Observatory (STEREO) showed that all the activities were coupled together, suggesting a global character of the magnetic eruption. We reconstruct the three-dimensional geometry of the polar crown filament using observations from three different viewpoints (STEREO A, B and SDO) for the first time. The filament undergoes two eruption processes. Firstly, the main body of the filament rises up, while it also moves towards the low-latitude region with a change in inclination by 48 degree and expands only in the altitudinal and latitudinal direction in the field of view of Atmospheric Imaging Assembly. We investigate the true velocities and accelerations of different locations along the filament, and find that the highest location always has the largest acceleration during this eruption process. During the late phase of the first eruption, part of the filament material separates from the eastern leg. This material displays a projectile motion and moves towards the west at a constant velocity of 141.8 km/s. This may imply that the polar crown filament consists of at least two groups of magnetic systems.

Comments: 23 pages, 10 figures, accepted for publication in ApJ
Subjects: **Solar and Stellar Astrophysics (astro-ph.SR)**
Cite as: **arXiv:1107.1391v1 [astro-ph.SR]**

Submission history

From: Li Ting [view email]
[v1] Thu, 7 Jul 2011 14:02:29 GMT (3729kb)

Which authors of this paper are endorsers?

Download:

- PDF
- PostScript
- Other formats

Current browse context:
astro-ph.SR
< prev | next >
new | recent | 1107

Change to browse by:
astro-ph

References & Citations
- INSPIRE HEP (refers to | cited by)
- NASA ADS

Bookmark(what is this?)

Link back to: arXiv, form interface, contact.