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Poster

2. Chromospheric heating and dynamics

A Magnetic Reconnection Event in the Solar Atmosphere Driven by Relaxation of a Twisted Arch Filament System

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We present high-resolution observations of a magnetic reconnection event in the solar atmosphere taken with the New Vacuum Solar Telescope, Atmospheric Imaging Assembly (AIA), and Helioseismic and Magnetic Imager(HMI). The reconnection event occurred between the threads of a twisted arch filament system (AFS) and coronal loops. Our observations reveal that the relaxation of the twisted AFS drives some of its threads to encounter the coronal loops, providing inflows of the reconnection. The reconnection is evidenced by flared X-shape features in the AIA images, a current-sheet-like feature apparently connecting post-reconnection loops in the $H_\alpha + 1$ Å images, small-scale magnetic cancelation in the HMI magnetograms and flows with speeds of 40–80 km s^{-1} along the coronal loops. The post-reconnection coronal loops seen in the AIA 94 Å passband appear to remain bright for a relatively long time, suggesting that they have been heated and/or filled up by dense plasmas previously stored in the AFS threads. Our observations suggest that the twisted magnetic system could release its free magnetic energy into the upper solar atmosphere through reconnection processes. While the plasma pressure in the reconnecting flux tubes are significantly different, the reconfiguration of field lines could result in transferring of mass among them and induce heating therein.
Key words: Sun: chromosphere C Sun: corona C Sun: filaments C magnetic reconnection