

EUV dimming associated with a coronal jet observed by SDO, Hinode and STEREO

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We have investigated a coronal jet observed near the limb on 2010 June 27 by the Hinode/X-Ray Telescope (XRT), EUV Imaging Spectrograph (EIS), and Solar Optical Telescope (SOT), and the SDO/Atmospheric Imaging Assembly (AIA), and on the disk by STEREO-A/EUVI. From EUV (AIA and EIS) and soft X-ray (XRT) images we have identified both cool and hot jets. There was a small loop eruption seen in Ca II images of the SOT before the jet eruption. We found that the hot jet preceded its associated cool jet by about 2 minutes. The cool jet showed helical-like structures during the rising period which was supported by the spectroscopic analysis of the jet's emission. The STEREO observation, which enabled us to observe the jet projected against the disk, showed dimming at 195Å along a large loop connected to the jet. We measured a propagation speed of 800 km s⁻¹ for the dimming front. This is comparable to the Alfvén speed in the loop computed from a magnetic field extrapolation of the photospheric field measured 5 days earlier by the SDO/Helioseismic and Magnetic Imager (HMI), and the loop densities obtained from EIS Fe XIV 264.79/274.20 line ratios. We interpret the dimming as indicating the presence of Alfvénic waves initiated by reconnection in the upper chromosphere.

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