

B24b Solar-B/EIS high-cadence observation of chromospheric evaporation

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We propose high-cadence observational program for Solar-B/EIS (EUV Imaging Spectrometer), focusing on the chromospheric evaporation process during the impulsive phase of flares.

In the coordinated observation between SOHO/CDS (Coronal Diagnostic Spectrometer) and Hida/DST (Domeless Solar Telescope) in July – August 2002, we have found short-lived 80km/s downflows during the flare impulsive phases in the transition region O v line ($\log T=5.4$). Previous observational results have given some confusion for the motions of flare transition regions: some found upward but some downward motions. Our results suggest that these downflows are a common characteristic of flares.

With Solar-B/EIS, we can observe higher temperature lines with better spectral resolution. We select 4 lines covering the wide temperature range; He II ($\log T = 4.7$), Mg VI ($\log T = 5.6$), Fe XII ($\log T = 6.1$), and Fe XXIV ($\log T = 7.3$). The first plan is a high time cadence (10 sec) sit-and-stare observation. It is estimated that 2 sec exposure is enough during the flare, and the time delay between the high speed flows in the different temperature ranges can be detected. Another plan is a moderate temporal resolution (40 sec) with spatial coverage. We can compare the velocity map with the spatial distribution of flare kernels observed in the chromospheric lines.