

### **Title3:**

#### **Connection between UV explosive event and magnetic cancellation**

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**Short title:** EEs and magnetic cancellation

**List of instruments and spacecraft:**

**XRT/HINODE, SOT/HINODE, EIS/HINODE, SUMER/SOHO**

#### **Science objective :**

UV explosive events (EE) are generally observed in regions with weak and mixed polarity fluxes along the magnetic network boundaries [Chae et al., 1998, ApJ, 497, L109]. Repeated occurrences of EE are initially found to be associated with the process of magnetic cancellation of mixed polarity fluxes (magnetic reconnection) [Chae et al., 1998]. However, spatial resolution of the magnetogram in the data analysis ( $\sim 2''$ ) is somewhat low as compared with the scale size of EE ( $\sim 1600 \text{ km}/2.3''$ ), and temporal resolution for magnetogram of 2.5G uncertainty in previous work ( $\sim 3$  minute) is also somewhat low as compared with the lifetime of EE ( $\sim 1$  minute) [Dere et al, 1989, Sol. Phys., 123, 41]. In order to establish a clear connection between EE and magnetic cancellation, it is needed to observe the magnetic cancellation with high spatial resolution and high temporal resolution. SOT onboard Hinode can produce magnetogram with spatial resolution as high as  $\sim 0.2''$  and temporal resolution as high as 30s. Moreover, the repetitive occurrence rate of EE is in the range of about 3 minute and 5 minute [Doyle et al., 2006, A&A, 446, 327], and the 5-minute modulation of EE occurrence is suggested be caused by 5-minute p-mode oscillation [Chen & Priest, 2006, Sol. Phys. 238, 313]. Therefore, it is necessary to investigate, from Dopplergrams measured by SOT, the relationship between the p-mode oscillation and EE occurrence rate.

#### **Target:**

Network boundaries in the quiet-Sun where EE often occurs

#### **Request to instruments:**

##### **Request to SUMER:**

Slit:  $120'' \times 1''$

X= $10''$ ; repetitive scanning over the x-range of  $10''$ ; move  $1''$  forward per raster step;

Exposure time: 30 sec

Repetition of scanning: 30 repetitions of scanning over the x-range;

Duration: 160 min

Spectral window: The line pair of Si IV ( $1393.78 \text{ \AA}$ ,  $1402.77 \text{ \AA}$ ) is used in particular for detection of EEs.

##### **Request to EIS:**

Slit:  $512'' \times 1''$

X=10"; repetitive scanning over the x-range of 10"; move 1" forward per raster step;

Exposure time: 30 sec

Repetition of scanning: 30 repetitions of scanning over the x-range;

Duration: 160 min

Line list: kpd\_01\_qs\_60, which contains some strong emission lines from chromosphere, upper transition region, corona, e.g. He II ( $5.0 \times 10^4$  K, 256.32 Å), Mg VI ( $4.0 \times 10^5$  K, 270.42 Å), Si VII ( $6.3 \times 10^5$  K, 275.35 Å), Si X ( $1.3 \times 10^6$  K, 258.49 Å), and Fe XV ( $2.0 \times 10^6$  K, 284.16 Å).

**Request to SOT:**

Dopplergram and magnetogram of high resolution

Spatial resolution: 0.08"/pixel

FOV: 328"x164"

Cadence: 0.5 minute

**Request to XRT:**

Imaging with high spatial resolution covering the area scanned by EIS and SUMER;

Cadence: 1 minute