



Observational study of intermittent solar jets with the Goode solar telescope

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We studied intermittent jet events using data from instruments on the Goode Solar Telescope at the Big Bear Solar Observatory (BBSO) derived from the TiO image of the wideband Imager (BFI), the H α image of the visible Light Spectrometer (VIS), and the magnetic fields of the near-infrared spectral polarizer (NIRIS). In addition, we also used Slit-Jaw Imager (SJI) data from the Interface Region Imaging Spectrograph (IRIS). These observations allow us to better characterize the burst jets. We found that the right of the main sunspot continued to erupt plasma material for up to 4 hours on August 6, 2016, NOAA AR 12571. The time distance diagram shows that the peak of the jet has obvious periodic eruption characteristics (5 minutes) during 18:00 UT-18:50 UT. We also found periodic brightening phenomenon (5 minutes) during jets bursts in the observed bands in the transition Region (1400Å and 2796Å), which may be a response to intermittent jets in the upper solar atmosphere. The time lag is 3 minutes. The evolution image of TiO band shows horizontal movement of granulation at jets position. We suggest that the horizontal

motion of the granulation in the photosphere drives the magnetic reconnection. The intermittent jet events we studied are triggered by magnetic reconnection process which is modulated by p-mode oscillations.

Compared with the quiet region of the sun, we found that the root of intermittent jets are enhanced at the center of the H α spectral line profile, but there is no significant change on the two sides of the line wing, which indicates that there may be a long time heating phenomenon at the root of intermittent jets.

References:

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