

High temporal resolution spectroscopic observation of transient phenomena with Hinode/EIS

Naoto Nishizuka

Kwasan and Hida observatories, Kyoto University

Takuma Matsumoto

Kwasan and Hida observatories, Kyoto University

Satoshi Morita

Kwasan and Hida observatories, Kyoto University

Hirohisa Hara

National Astronomical Observatory of Japan

Kazunari Shibata

Kwasan and Hida observatories, Kyoto University

Abstract. Hinode discovered numerous jets in the solar atmosphere, not only in the corona but also in the chromosphere. These jets show several evidence of magnetic reconnection, indicating that reconnection is ubiquitous and occurs almost everywhere on the sun. Hinode also discovered Alfvén wave associated with jets. The EUV imaging spectrometer (EIS) on board Hinode has revealed the plasma motion of jets/micro-flares. However the time scale of jets/micro-flares is not so large that we could not directly see the dynamics of jets, such as slow shock or magnetohydrodynamic wave, with spectroscopic observation. We examined spectroscopic data of Hinode/EIS with high temporal resolution in detail. We used the data of “sit & star” observation, in which a slit position is fixed at one location and high cadence observation is performed. First, we investigated Doppler velocity and line broadening with Fe XII 195.2 Å emission line data and discovered 88 transient events. Then we did coalignment between the slit position and an X-ray image take with Hinode/XRT and identified the events. For example, we found an event of jet near the active region on 2007 February 20, which show that apparent velocity of a jet is ~ 170 km/s and Doppler velocity is ~ 150 km/s. So we can estimate the real velocity of the jet is ~ 240 km/s. In this paper, we show a result of these high cadence spectroscopic observations of transient phenomena with Hinode/EIS.