[초SE-17] FISS Observations of Shocks in the Solar Chromosphere

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Shocks are thought to be important in the dynamics and heating of the solar chromosphere. The observational determination of shock parameters, however, has been hardly done because of the difficulty of observation at a high spatial, temporal and spectral resolution, and the lack of an effective method of inferring physical parameters from spectral data. Our inversion of the spectral data of the Hα and Ca II 854.2 nm lines simultaneously taken from an intranetwork area, produced temporal profiles of temperature as well as line-of-sight velocities, from which we infer that three-minute chromospheric oscillations prevailing in the upper chromosphere are in fact trains of strong shocks with a strength of about two and a propagation speed of 20 km s-1 that carry a mechanical energy flux of 500 W m-2 upward. Our result supports the notion that shocks dominate the heating of the upper chromosphere, and probably the corona as well, at least in intranetwork regions of the quiet sun.

[구SE-18] Observations of Solar Filaments with Fast Imaging Solar Spectrograph of the 1.6 meter New Solar Telescope at Big Bear Solar Observatory

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Fast Imaging Solar Spectrograph (FISS) is an instrument developed by Seoul National University and Korea Astronomy and Space Science Institute and installed at the 1.6 meter New Solar Telescope of Big Bear Solar Observatory. Using this instrument, we observed solar filaments and analyzed the data focusing on determining the temperature and non-thermal velocity. We inferred the Doppler absorption widths of Hα and Ca II 8542Å lines from the line profiles using the cloud model. From these values, we separately determined temperature and non-thermal velocity.

Our first result came from a solar filament observed on 2010 July 29th. Temperature inside a small selected region of this ranges from 4500K to 12000K and non-thermal velocity, from 3.5km/s to 7km/s. We also found temperature varied a lot with time. For example temperature at a fixed point varied from 8000K to 18000K for 40 minutes, displaying an oscillating pattern with a period of about 8 minutes and amplitude of about 2000K. We will also present new results from filaments observed in 2011 summer.