

Characteristics of the Upflow in the Plage Region During the Gradual Phase of the X3.2 Flare on December 13, 2006

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We present HINODE/EIS raster scan observations of plage region taken during the gradual phase of the X3.2 flare developed on December 13, 2006. The plage region is located 200 arcsec eastward from the flare arcade. The spectral observations with multi-wavelength allow us to determine velocities from the Doppler shifts in various temperatures. Strong upflows with motionless plasma are observed in the FeXV line 284.2 Å ($\log T = 6.3$) in the plage region. The strong upflows are almost 200 km/sec which is calculated by two component Gaussian fitting. On the other hand, at the transition region temperature (HeII, 256.3 Å, $\log T=4.7$), very weak upflows, almost motionless, are observed. Furthermore, we found these upflow velocities clearly depend on the temperature, by comparing the upflow velocities among FeXV, FeXVI, FeXIII, FeXII, FeXI, FeX and FeVIII. The hottest line, FeXV, shows the fastest upflow velocity and the second-highest line, FeXIV, shows the second-highest upflow velocity (130 km/sec). The upflow velocities of other Fe lines also follow the order of temperature. All velocities are below the sound speed, but the dependence of velocities on temperature is similar to the dependence of sound speed on temperature. To complement of global dynamics to EIS data, we use EIT data. In this talk, we discuss the characteristics of the plasma which shows the blue shift in the plage region using Doppler shift, temperature and line width.