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Relationship between ion temperature and coronal heating in solar atmosphere

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We have studied the characteristics of the ion temperature and non-thermal velocity in an active region observed by the EUV Imaging Spectrometer (EIS) onboard Hinode. We used two emission lines of different atomic species (Fe XVI S XIII) to distinguish the ion thermal velocity from the observed Doppler width. We assumed that the sources of two emission lines are the same temperature. We also assumed that they have the same non-thermal velocity. With these assumptions, we could obtain the ion temperature with the help of their differences in mass. What we found is as follows: (1) the common ion temperatures obtained by Fe XVI and S XIII are 2.5 MK, (2) the typical non-thermal velocities are 13 km/s, (3) the hot ions are observed at the bright region in Fe XVI, while (4) the high non-thermal velocities are preferentially observed in the dark region which locates between the bright points.

Keywords: coronal heating, ion temperature, Non-Equilibrium Ionization