

Ion temperature and non-thermal velocity in a solar active region

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Abstract. We have studied the characteristics of the ion thermal 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 (FeXVI 262.98Å and SXIII 256.69Å) to distinguish the ion thermal velocity from the observed full width at half-maximum. We assumed that the sources of the two emission lines are the same thermal temperature. We also assumed that they have the same non-thermal velocity. With these assumptions, we could obtain the ion thermal temperature, after noting that $M_{\text{sulfur}} \sim 0.6M_{\text{iron}}$. We have carried out the ion thermal temperature analysis in the active region where the photon counts are sufficient (>4500). What we found is as follows: (1) the common ion thermal temperatures obtained by FeXVI and SXIII are ~ 2.5 MK, (2) the typical non-thermal velocities are $\sim 13 \text{ km s}^{-1}$, (3) the highest non-thermal velocities ($>20 \text{ km s}^{-1}$) are preferentially observed between the bright points in FeXVI, while (4) the hottest material (>3 MK) is observed relatively inside the bright points compared with the highest non-thermal velocity region.