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The observed Si III line intensities and the electron kappa-distribution

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Abstract. The intensity ratios of Si III lines observed by SUMER in 1100-1320 Å region do not correspond to the line ratios computed under an assumption of the Maxwellian electron distribution. Pinfield et al.(1999) have analysed spectrum from SUMER and concluded that enhanced intensity of the Si III 1313 Å line can be explained by the presence of a non-thermal electron distribution. The transition region satisfies the conditions for appearance of the non-thermal kappa-distribution. Therefore we have computed a set of synthetic spectra of Si III for different values of the parameter kappa of the non-thermal electron kappa-distribution. The radiation field has been included into our computations too. All used line ratios were sensitive to T, density and the parameter kappa. We have proposed the diagnostics of the parameter kappa and other plasma parameters. All these parameters have been determined from the SUMER observations for the coronal hole, quiet Sun and active region. The results obtained from the non-thermal analysis are discussed.