

*Hinode-3: 3rd Hinode Science Meeting
Hitotsubashi Memorial Hall, Tokyo
1-4 December, 2009*

Diagnostics of non-thermal distribution from RESIK and RHESSI flare spectra

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Abstract. Solar flare spectra observed by the X-ray spectrometers RESIK and RHESSI with high energy resolution enabled us to analyse possible non-thermality of plasma electron distribution in the keV range. For RESIK diagnostics (in the 2-4 keV range) we assumed that the bulk of the plasma is represented by the so-called n-distribution, which describes the deviations from the Maxwellian distribution by two parameters: n and T. Using thick target approximation for RHESSI spectral analysis, we obtained characteristics of injected electron power-law distribution in the deka-keV range. The events presented here show a very good time correlation of non-thermality obtained from the RESIK spectra with appearance of non-thermal component in RHESSI and/or radio spectra. Both spectral and imaging information in RHESSI soft and hard X-ray ranges were used for the estimation of the ratio of thermal to non-thermal electron densities of the X-ray emitting plasma. This ratio together with the parameters of n- and power-law distributions will be used in future modelling and analyses of flare X-ray spectra.