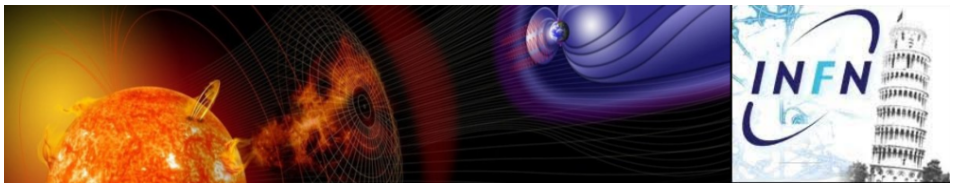

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Plasma dynamics in the flaring loop observedby RHESSI

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Hard X-rays (HXR) contain the most direct information of non-thermal electron population in solar flares. The HXR emission mechanism, known as the thick-target model, is well developed. It gives an opportunity to diagnose the physical conditions within a flaring structure. The thick-target model predicts that in flare foot points we should observe lowering of HXR sources altitude with increasing energy. The foot point HXR sources result from direct interaction of non-thermal electron beams with plasma in the lower part of the solar atmosphere, where the density increases rapidly. Therefore, we can estimate the plasma density distribution along the non-thermal electron beam directly from the observations of the altitude-energy relation obtained for the HXR foot point sources. However, the relation is not only density dependent. Its shape is determined also by the power-law distribution of non-thermal electrons. Additionally, during the impulsive phase, the plasma density and a degree of ionization within foot points may change dramatically due to heating and chromospheric evaporation. For this reason the interpretation of observed HXR foot point sources' altitudes is not straightforward and needs a detailed numerical modelling of the electron precipitation process. We present the results of a detailed analysis of one well observed solar flare. We used HXR observations obtained by RHESSI. The numerical model was calculated using the hydrodynamic 1D model with an application of the Fokker-Planck formalism for non-thermal beam precipitation. We found that HXR data may be used to trace details of chromospheric density changes. The estimated amount of mass evaporated from the chromosphere is of the order of the amount of additional mass that was observed to occur in the loop-top source.

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