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# On the origin of sub-THz emission from solar flares

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Time delays between sub-THz (> 100 GHz) and soft X-ray emission from solar flares with the positive spectral slope at sub-THz frequencies are considered. For 11 solar events we did the cross correlation analysis of light curves obtained with KOSMA (230 GHz), SST (212 GHz), RT-7.5 (93 GHz), and GOES satellites in the 1-8 Å channel in order to detect the Neupert effect. All flares were divided into two types. Type I includes four X -class flares with well pronounced Neupert effect. Type II includes seven M-class flares where Neupert effect was not clearly defined, and time delays do not exceed 30 s.
To explain the obtained results within the framework of the thermal chromospheric model we consider hard X-ray and radio emission from the SOL2012-07-04T09:55 solar flare with the positive spectral slope at sub-THz frequencies. The temporal evolution of thermal bremsstrahlung of chromospheric plasma observed at sub-THz frequency range from this flare has been studied. For that reason we employ F-CHROMA models based on RADYN code which describes the response of chromospheric plasma to the flux of accelerated electrons in the triangular pulse. The region of low temperature and high plasma density in a flare chromospheric source, which moves to the higher altitudes and absorbs the sub-THz emission has been revealed. The calculated time profile of sub-THz emission suggests that we cannot explain Type II events in terms of the proposed model. The plasma of solar chromosphere heated by accelerated coronal electrons produces the sub-THz emission several times less than the observed sub-THz emission fluxes during the SOL2012-07-04T09:55 flare. The interpretation of the results is proposed.

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