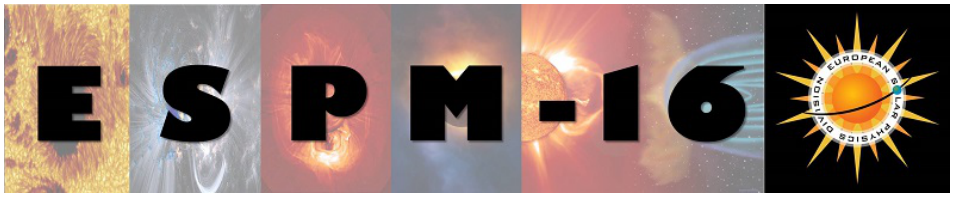

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Simulation of thermal sub-THz emission from solar flares

Tuesday, 7 September 2021 11:26 (13 minutes)

Since the beginning of this century it became possible to make observations of solar flares in subterahertz (sub-THz) frequency range at a few frequencies in the range of 100-400 GHz. Within these observations some of M- and X-class solar events had a spectral (sub-THz) component that grew with frequency. To understand the origin of this phenomenon, we simulated the plasma density and temperature evolution in a flare loop, caused by interaction between the injected accelerated electron beams, which travel from the reconnection site in the region of the coronal loop-top down to lower layers of the solar atmosphere. The numerical code FLARIX used for simulations allowed us to define the dynamics of the flare plasma parameters at different heights, based on the equations of radiation hydrodynamics. Using the simulation results, we inferred the thermal bremsstrahlung emission in the sub-THz and X-ray ranges. The comparison of the obtained simulation results with observational data is under discussion. This work was partly supported by the RFBR (N20-52-26006), the Ministry of Education and Science (Research Work No. 0831-2019-0006), RVO: 67985815, project LM2015067: EU-ARC.CZ, 21-16508J of the Grant Agency of the Czech Republic.

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