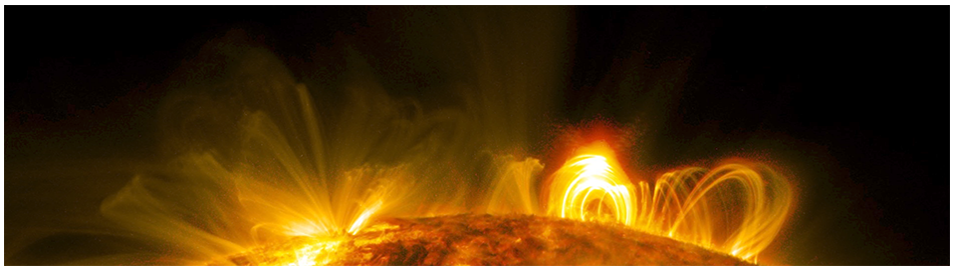

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Modeling Large-scale Electron Acceleration in Solar Flare Magnetic Reconnection Region

Thursday 18 November 2021 09:45 (1 hour)

Recent multi-wavelength observations (e.g., by EOVSA, RHESSI, and STIX) show that nonthermal emissions could fill up a significant portion of the solar flare reconnection region. The electrons responsible for these emissions contain a substantial fraction of the released magnetic energy and often develop power-law energy tails. In this study, we model the large-scale electron acceleration by solving the energetic particle transport equations using background MHD fields. Due to flow compression, electrons are accelerated to hundreds of keV and develop nonthermal power-law distributions, both of which are consistent with the observations. The model-generated spatially and temporally dependent electron distributions can be used for producing synthetic radio or hard X-ray emission maps, which can be directly compared with radio and hard X-ray observations. These results have important implications for understanding large-scale electron acceleration during impulsive flares.

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