

2013年5月13日のXクラスフレアにおける非熱的電子の空間分布 Spatial distribution of nonthermal electrons in an X-class flare on 13 May 2013

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Four X-class flares took place in May 2013. Fortunately three of four were observed with Nobeyama Radioheliograph (NoRH). One of them occurred behind the east limb on 13 May 2013. It is a good chance to investigate the height distribution of nonthermal electrons in the solar corona. In the framework of the standard flare model based on magnetic reconnection, Minoshima et al. (2011) showed that the height distribution of accelerated/heated electrons depends on the energy of the electrons. NoRH has a capability to observe a solar flare in 17 and 34 GHz with a high time resolution (100 ms). The energy of electrons emitting microwaves is very high (~MeV), and the mean-energy emitting 34 GHz is higher than that for 17 GHz. Hard X-rays are emitted by relatively lower-energy (~100 keV) electrons. So this dataset can cover a wide energy range of accelerated electrons. In order to understand the electron acceleration/transport/loss processes, multi-wavelength observation is crucially important. The 13 May 2013 flare was simultaneously observed with NoRH and RHESSI (The Reuven Ramaty High Energy Solar Spectroscopic Imager). Investigating the distribution of these emission sources in the solar corona, we discuss the electron acceleration/transport/loss processes.

Keywords: solar flare, particle acceleration, microwave, hard X-ray, solar corona, magnetic reconnection