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Radio imaging of quasi-periodic magnetic reconnection and electron acceleration during a solar flare

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We analyze a C-class solar flare with the microwave (MW) data from Expanded Owens Valley Solar Array (EOVSA) and the SDO/AIA data. We find that the flare is led by an erupting filament. The interesting result is that the flare produces two MW sources, which lay at loop-top region and the region above that, respectively. Moreover, the brightness temperatures of the two sources, as well as derivative curve of GOES soft X-ray flux, change synchronously with a quasi-period of about 40 seconds. At the peak moments, the spectra of both sources show non-thermal gyrosynchrotron characteristics. The results suggest that quasi-periodic magnetic reconnection accelerates electrons, which then produce quasi-periodic MW radiation near the reconnection region and at the loop-top region.

Primary authors: KOU, Yuankun (Nanjing University); CHENG, Xin (Nanjing University)

Co-authors: YU, Sijie (New Jersey Institute of Technology); CHEN, Bin (New Jersey Institute of Technology); DING, Mingde (Nanjing University)

Presenter: KOU, Yuankun (Nanjing University)

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