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Multi-wavelength Observations of Electron Acceleration in a Series of Solar Microflares

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Like their larger counterparts, solar microflares release magnetic energy and accelerate particles to relativistic speeds. Even though they are generally shorter and often more compact than larger flares, they can display a surprising complexity and provide new insights into where and when particles are accelerated. Signatures of accelerated electrons are most readily observed at X-ray and radio wavelengths. We present observations of multiple electron acceleration sites and times during a series of solar microflares observed with the RHESSI X-ray instrument and at radio wavelengths with the Karl G. Jansky Very Large Array (VLA).

Multiple microflares were observed from the same active region over a period of 45 minutes. The VLA was observing the Sun during the same period at a time resolution of 50 ms at frequencies between 1 to 2 GHz. The radio dynamic spectra show a variety of features, like extremely short lived periodic spikes, drifting bursts, and broad band emission. While some of these emissions were temporally associated with X-ray sources, they originated from a different location. The observations suggest that, even in short, compact flares, acceleration of electron can take place at multiple locations, either co-temporally or at multiple instances during the course of the flare.

Student poster?

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