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Hard X-Ray Imaging Spectroscopy of Solar Flares A. GORDON EMSLIE, Western Kentucky University — Large solar flares are characterized by copious emission of hard X-rays produced by bremsstrahlung of accelerated electrons on ambient protons and ions in the target solar atmosphere. Important information on the physics underlying the electron acceleration and transport can be obtained through analysis of the hard X-ray radiation field. The NASA RHESSI mission, launched in 2002, produces hard X_ray images with exquisite energy resolution, with user-selectable time and energy bins. Since spatial information is encoded through a Rotating Modulation Collimator instrument design, the immediate data product is not a traditional pixel-by-pixel image but rather a set of two-dimensional spatial Fourier components termed "visibilities." Obtaining information on the spatial distribution population of flare-accelerated electrons therefore involves two inversion steps – one from the photon domain to the electron domain, and one from the Fourier domain to the spatial domain. I will report on a novel method of performing this analysis, which has provided some very meaningful constraints on the location and physical characteristics of the electron acceleration region, and on the efficiency of the acceleration process itself.

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