

Evidence for magnetic asymmetry in flare loops from HXR footpoint sizes

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We have investigated the origins of asymmetry in magnetic flare loops using visibility forward fitting for RHESSI hard X-ray modulation profiles. To this end, we have made 8-parameter fits to Fourier visibilities of double-source flares and determined footpoint areas, fluxes, and positions. These data show quite directly whether magnetic asymmetry exists in flare loops, and can test existing models which invoke magnetic convergence at one end of a loop. In such models, the converging magnetic field lines mirror precipitating high-energy electrons preferentially towards the other footpoint. We find, in fact, that in many cases the weaker source tends to have smaller area, which supports this picture. This suggests that the acceleration process could be bilaterally symmetric, even if the hard X-ray sources differ in flux.