



STEREO/RHESSI studies of CME acceleration and particle acceleration in flares

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Using the potential of two unprecedented missions, Solar Terrestrial Relations Observatory (STEREO) and Reuven Ramaty High-Energy Solar Spectroscopic Imager (RHESSI), we study three well-observed fast coronal mass ejections (CMEs) that occurred close to the limb together with their associated high-energy flare emissions in terms of RHESSI hard X-ray (HXR) spectra and flux evolution. From STEREO/EUVI and STEREO/COR1 data, the full CME kinematics of the impulsive acceleration phase up to 4 Rs is measured with a high time cadence of about 2.5 minutes. The CME maximum acceleration is achieved at heights below 0.5 Rs, and the peak velocity at heights of about 2.1 Rs and lower. We find that the CME acceleration profile and the flare energy release as evidenced in the RHESSI HXR flux evolve in a synchronized manner. These results support the 'standard' flare/CME model which is characterized by a feedback relationship between the large-scale CME acceleration process and the energy release in the associated flare.