

Global Energetics of Solar Particle Events

In a solar event, energy is released in many forms such flare emissions (X-rays, gamma-rays radio, thermal), kinetic and potential energy in coronal mass ejections and other mass motions, and energetic particles. The global energetics of 38 large solar events were discussed by Emslie et al. (2012; doi: 10.1088/0004-637X/759/1/71). However, additional insight may be obtained by incorporating multi-point observations from STEREO, and improved solar observations from SDO, motivations for a new study of global energetics focusing on 398 M and X class flares in June, 2010 to January, 2014 (Aschwanden et al., 2017; doi: 10.3847/1538-4357/836/1/17). We discuss efforts to estimate the global energy content of the solar energetic particles (protons, heavy ions and electrons), if detected, associated with these flares for this study, focusing on the subset of particle events observed at both STEREO spacecraft and near the Earth. For these events, we estimate that the SEP total energy is a few percent of the energy of the associated coronal mass ejection.

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