

Coronal hard X-rays, CMEless X-class flares, and fast atoms

The RHESSI data reveal a wealth of coronal hard X-ray sources, both in the impulsive phase and in the extended nonthermal phase. The latter are strongly associated with CME occurrence and the related global shock wave. Major flare events without CMEs have significantly different morphology: no soft-hard-harder evolution in the hard X-ray spectrum and weak soft X-ray precursors. This presentation reviews the data for the CMEless X-class flare list of Gopalswamy et al. (2009) and discusses interpretations of these and of the phenomena associated with CME flares. I argue that the time has come for a paradigm shift in the interpretation of coronal global waves (Ontiveros & Vourlidas 2009). Given time I will also discuss a new observational tool that we should employ to learn the whole story - energetic neutral atoms from flares (Mewaldt et al. 2009).