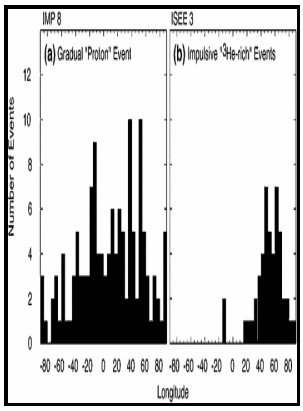
Dynamic evolution of the source volumes of gradual and impulsive solar flare emissions

NASA - Energetic electrons in impulsive solar flares: Radio diagnostics



Description: -
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History, Modern -- 20th century -- Dictionaries.
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Solar flaresDynamic evolution of the source volumes of gradual and impulsive solar flare emissions
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Notes: Bibliography: p.36-37.
This edition was published in 1987

Tags: #Microwave #Spectral #Evolution #of #Solar #Flares

A circular white

Figure highlights four times during the flare evolution: pre-flare, main flare peak, EUV late phase peak, and post-EUV late phase. Further, we noticed the eruption of one leg of the filament L1 prior to the onset of the precursor phase. Such a difference is an observational constraint for electron acceleration and transport theories in flare models.

NEW SOLAR EXTREME

Download figure: As shown in Figure c , the fast downward contractions, especially those later blue-colored ones, start well above the hot loop-top region and travel into it with deceleration for some distance before fading below detection. Note that these observed values are lower limits, because loops, especially those detected at the edge of AIA's FOV, could continue contraction before and after their observed intervals when their emission remains below detection. Another part of the released energy is transported upward as an ejecting plasma blob called plasmoid.

NEW SOLAR EXTREME

We color-code fits to tracks of different categories: upward ejections in red and downward contractions in cooler colors. As shown in Figure top , each channel has a generally broad response with one to a few peaks. Introduction There is ample evidence that microwave and hard X-ray emissions are produced by nonthermal electrons in different solar atmospheric layers during flare eruption e.

Microwave Spectral Evolution of Solar Flares

Fitting the nonthermal radio spectra as gyrosynchrotron radiation from a homogeneous source model with constant magnetic field yields the physical properties of the flaring source, that is, total number of electrons, power-law index of the electron energy distribution, and the nonthermal source size. For example, the microwave spectral index can be derived only at 02:19:26 and 02:24:34 UT out of 4 discrete times for the 2003 May 13 flare, as shown in. Based on the study and interpretations, we propose a unified scheme of energy release during the precursor and main phase emission in the flare event of investigation.

Scientific Objectives

The fitting algorithm is very sensitive to the data quality, and the result can be strongly biased by noise at the high-frequency end of the microwave spectrum. It explains the observed energy dispersion of the X-ray loop-top centroids shown in Figure e because of the exponential shape of thermal bremsstrahlung spectra Equation. A return current builds up to conserve charge and current neutrality Spicer and Sudan ; van den Oord ; Benz.

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