

Waiting-Time Distribution and Sympathetic Solar Events

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“Waiting-time Distribution” is defined as a histogram of time intervals between successive events. The waiting-time distribution can provide us with statistical information on the probability of the next event occurring within a time interval after one event takes place. If the number of sympathetic events is not negligible, an overabundance will appear in short time intervals of the waiting-time distribution relative to a Poisson distribution, because sympathetic events literally have an interdependency, while a Poisson distribution implies a totally random process. In this paper, we present the waiting-time distributions of different solar events : X-ray solar flares (J. Geophy. Res. 2001, 106, 29951), sympathetic flares (ApJ, 2002, 574, 434), and coronal mass ejections (ApJ, 2003, 588, 1176). As a result, we found the first strong statistical evidence for sympathetic flares. In addition, we present a plausible candidate of sympathetic coronal mass ejections using a series of EUV coronal images.