

## The Coronal Magnetic Field: Structure and Dynamics

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Solar ares originate from rapid rearrangements of the magnetic \_eld network in the corona. Loops of ux reconnect or snap into lower energy con\_gurations when they are overly stressed. Our recent analysis of observational data reveals that the loops (links) and footpoints (nodes), where they attach on the photosphere, embody a scale free network. The statistics of the ares and of the network structure are uni\_ed through a dynamical model where the avalanches and network co-generate each other into a complex, critical state. Introducing thresholds to analyze time series of emission from the Sun enables a new and simple de\_nition of solar are events, and their interoccurrence times. Rescaling time by the rate of events, the waiting and quiet time distributions both conform to scaling functions that are independent of the intensity threshold over a wide range. We also show that quiet times with a power law distribution are typically found in models of self-organized criticality, such as the sandpile model, when a su\_ciently large intensity threshold or resolution parameter (greater than one toppling) is introduced to de\_ne bursts.

Keywords: corona; magnetic network; self-organized criticality; complex networks, solar ares, waiting times.

## References

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