Project Details

ROSES ID: NNH10ZDA001N
Selection Year: 2011
Program Element: Solar Dynamics Observatory

Project Title: Self-Organized Criticality in Solar Physics

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Summary:
The solar corona is a nonlinear dissipative system
that exhibits self-organized criticality (SOC),
regarding the generation of magnetic flux elements,
nano/flash, microflares, large flares, and CMEs.

With AIA we can study for the first time extensive
statistics of these SOC phenomena with high
spatial resolution, high cadence, and comprehensive
temperature coverage, which will greatly
improve new physical insights into the dynamics
and statistics of solar phenomena, such as
the role of nano/flash for coronal heating, the
universal relationship between the fractal geometry
of energy dissipation domains and energy frequency
distributions, or scaling laws between geometric
and physical solar flare parameters. SOC phenomena
are also common in geophysics (earthquakes),
magnetospheric physics (auroral emission, substorms),
stellar physics (stellar flares), pulsars (giant pulses),
and accretion disks around black holes. We propose to
analyze and model SOC phenomena from SDO/AIA and HMI data,
which have optimum cadence, spatial resolution, and complete
time and temperature coverage.
Publication References:

Summary: no summary


Summary: no summary


Summary: no summary