Long-range couplings between drivers of space weather

as observed with SDO’s Atmospheric Imaging Assembly
and the STEREO spacecraft

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For American Geophysical Union, December 2010
The solar surface is threaded by magnetic field concentrated in a multitude of small clusters and few
A magnetograph (SDO’s HMI) maps the field with polarized light.

The field has two polarities, north and south (shown in dark and bright shades of grey).
Above the surface, the field forms nested arcades which evolve in response to the changing surface field.
The magnetic field guides energy upward resulting in the hot corona, which frequently explodes
Many flares/eruptions happen 2010/10/21 SDO/AIA (nearly) simultaneously.

“Sympathetic flaring” inferred since ~1936; SDO and STEREO enable us to see and understand the connections.
From three perspectives, experimenting with time

Magnetic maps from full-sphere assimilation model
Computer model of the coronal magnetic field
From three perspectives

STEREO Behind

SDO/AIA 304A

STEREO Ahead
Modeled field on AIA image set
Eruptions and flares: frequently coupled across large distances