

Project Details

ROSES ID: NRA-03-OSS-01

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Program Element: Independent Investigation: LWS

Project Title:

Fields, Fractals, and Flares: Understanding Magnetic Coimplexity in Solar Active Regions

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Summary:

Solar active regions are the source of many energetic and geo-effective events such as solar flares and coronal mass ejections (CMEs). Understanding how these complex source regions evolve and produce these events is of fundamental importance, not only to solar physics, but also to the demands of space weather forecasting. We propose to investigate the physical properties of active region magnetic fields using fractal-, gradient-, neutral line-, emerging flux-, and wavelet-based techniques, and to correlate them with solar activity. This will form the basis of a real-time online database of spaceweather-relevant data products. This timely study represents a non-phenomenological approach to describing and understanding active region evolution and the conditions that result in energy release. The results of this study will provide an important knowledge base for future missions within the Living With a Star (LWS) program, such as the Solar Dynamics Observatory (SDO), and the development of online environments such as the Virtual Solar Observatory (VSO).

Publication References:

Summary: "

Reference: Peter Gallagher / GSFC - Fields, Fractals, and Flares: Understanding Magnetic Complexity in Solar Active Regions