

## Project Details

**ROSES ID:** NNH11ZDA001N

**Selection Year:** 2012

**Program Element:** Focused Science Topic

**Topic:** Flare Dynamics in the Lower Solar Atmosphere

**Project Title:**

Coupling of Particle Acceleration and Atmospheric Response Processes in Solar Flares: Combined Kinetic-fluid Modeling and Multiwavelength Observations

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**Project Member(s):**

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**Summary:**

We propose to investigate the coupling between particle acceleration and the dynamic response of the lower solar atmosphere to the energy input during flares. We propose a combined kinetic-particle and hydrodynamic simulation, and analysis of observations from different wavelengths. This work directly addresses the "Focused Science Topic (a) Flare Dynamics in the Lower Solar Atmosphere" in the 2011 LWS TR&T solicitation. We seek answers to the following Compelling Science Questions:

1. What is the fundamental mechanism that accelerate particles in solar flares?
2. How does the lower solar atmosphere, particularly the chromosphere, respond to the impulsive energy input?
3. How are the particle acceleration and atmospheric response coupled together and affect each other?

Answering these questions will enable us to constrain the acceleration mechanism, understand the process of evaporation and seismic wave generation. The major strengths of the proposed work lie in our expertise in particle acceleration and the unique contribution this will provide for the LWS focused science topic, and our past experience in the coupling between acceleration and hydrodynamic response.

## Publication References:

**Summary:** no summary

**Reference:** Omodei, N.; Petrosian, V.; Pesce-Rollins, M.; the Fermi-LAT Collaboration; (2013), Fermi-LAT Observation of Impulsive Solar Flares, eprint arXiv:1304.0798