Project Details

ROSES ID: NNH06ZDA001N
Selection Year: 2007
Program Element: Focused Science Topic

Topic: Understand how Flares Accelerate Particles near the Sun (i.e., through Shocks and/or Reconnection) and how they Contribute to Large SEP Events

Project Title:
3D MHD Modeling of Flare Reconnection for Solar Energetic Particle Acceleration

PI Name: Judy Karpen
PI Email: Judy.Karpen@nasa.gov
Affiliation: Naval Research Laboratory
Project Member(s):
- Lynch, Benjamin J; Co-I; University of California-Berkeley
- Edmondson, Justin K; Graduate/Undergraduate Student; University of Michigan
- Antiochos, Spiro K.; Co-I; NASA, Goddard SFC
- MacNeice, Peter ; Collaborator; NASA/GSFC

Summary:
Objective: to determine the connectivity changes, observable signatures, and energy budget of flare reconnection driven by a self-consistent solar eruption. Results can be used as input for particle acceleration models and compared with SEP and radio observations.

Methods: numerical simulations with ARMS, our massively parallel 3D MHD code with adaptive mesh refinement. Postprocessing with Heliospace and other software to determine field topology and predict observable signatures.

Significance: understanding the 3D reconnection process through modeling driven in a self-consistent and realistic manner is an essential component of a team approach to solving the flare particle acceleration problem.

Publication References:

Summary: no summary

Reference: Karpen, J. T.; Antiochos, S. K.; DeVore, C. R.; Linton, M. G.; (2010), A Numerical Investigation of Unsheared Flux Cancelation, Magnetic Coupling between the Interior and Atmosphere of the Sun, edited by S.S. Hasan and R.J. Rutten; Astrophysics and Space Science Proceedings. ISSN 1570-6591 (Print) 1570-6605 (Online) Published by Springer Berlin Heidelberg; ISBN 978-3-642-02858-8 (Print) 978-3-642-02859-5 (Online), pp.518-519, doi: 10.1007/978-3-642-02859-5_79