Curriculum Vitae: Wei LIU

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Education

Ph.D. in Physics, Stanford University, Stanford, California 12/2006
Dissertation: *Characteristics of Solar Flare Hard X-ray Emissions: Observations and Models*
Reading Committee: Profs. Vahé Petrosian (adviser), Philip H. Scherrer, and Peter A. Sturrock

M.S. in Space Physics, University of Science and Technology of China, Hefei, Anhui, China 06/2000
Adviser: Prof. Y. Q. Hu
Thesis: *Solar Prominence Disturbances Associated with Photospheric Magnetic Flux Emergence and Cancellation: a Magnetohydrodynamic Simulation Study*

B.S. in Space Physics, University of Science and Technology of China, Hefei, Anhui, China 07/1997

Work Experience

Research Associate 02/2009 – present
Stanford-Lockheed Institute for Space Research, Palo Alto, California

NASA Postdoctoral Program (NRC) Fellow 01/2007 – 01/2009
RHESSI group, Solar Physics Laboratory, NASA Goddard Space Flight Center, Greenbelt, Maryland

Research Assistant 06/2002 – 12/2006
Prof. V. Petrosian Group, Department of Physics, Stanford University, Stanford, California

Resident Observer 09/2002 – 01/2003
Wilcox Solar Observatory (WSO), Stanford University, Stanford, California

Research Assistant 06/2000 – 06/2002
Prof. Scherrer Solar Physics Group, Hansen Experimental Physics Lab, Stanford University, California

Professional Affiliations

Sigma Xi, the Scientific Research Society 2008 – present
American Astronomical Society (AAS) / Solar Physics Division (SPD) 2002 – present
American Geophysical Union (AGU) 2001 – present

Community Services

Reviewer for papers in *Solar Physics*, *Astrophysical Journal*, proposals for *NASA Research Opportunities*
EPO volunteer, *NASA at the Smithsonian Folklife Festival*, Washington DC 07/2008

Honors and Awards

NASA Postdoctoral Program (NPP) Fellowship, previously known as the National Research Council (NRC) Postdoctoral Fellowship, 2007 – 2009
AAS/SPD Studentship Award, 2003
Adviser of a team winning Honorable Mention Award in the US Mathematical Contest in Modeling, 2000
Meritorious Award in the US Mathematical Contest in Modeling (MCM), 1997
First-class Award in the MCM, Chinese Society for Industrial and Applied Mathematics, 1995 & 1996

Publications

Refereed Journals

14. **Liu, W.**, Petrosian, V., & Mariska, J. T. "Combined Modeling of Acceleration, Transport, and Hydrodynamic Response in Solar Flares: I. The Numerical Model", 2009, submitted to *ApJ*.
13. **Liu, W.**, Wang, T. J., Dennis, B. R., & Holman, G. D. "Episodic X-Ray Emission Accompanying the Activation of an Eruptive Prominence: Evidence of Episodic Magnetic Reconnection", 2009, *ApJ*, 698, 632-640.
12. **Liu, W.**, Petrosian, V., Dennis, B. R., & Holman, G. D. "Conjugate Hard X-ray Footpoints in the 2003 October 29 X10 Flare: Unshearing Motions, Correlations, and Asymmetries", 2009, *ApJ*, 693, 847-867.
11. **Liu, W.**, Petrosian, V., Jiang, Y. W., & Dennis, B. R. "Double Coronal Hard and Soft X-ray Source Observed by RHESSI: Evidence for Magnetic Reconnection and Particle Acceleration in Solar Flares", 2008, *ApJ*, 676, 704-716.
10. **Liu, W.**, Liu, S., Jiang, Y. W., Petrosian, V. "RHESSI Observation of Chromospheric Evaporation", 2006, *ApJ*, 649, 1124-1139.
9. Jiang, Y. W., Liu, S., **Liu, W.,** & Petrosian, V. "Evolution of the Loop-top Source of Solar Flares: Heating and Cooling Processes", 2006, *ApJ*, 638, 1140-1153.
8. **Liu, W.**, Jiang, Y. W., Liu, S., & Petrosian, V. "RHESSI Observations of a Simple Large X-Ray Flare on 2003 November 3", 2004, *ApJ Letters*, 611, L53-L56.
7. Boberg, F., Lundstedt, H., Hoeksema, J. T., Scherrer, P. H., & **Liu, W.** "Solar Mean Magnetic Field Variability: a Wavelet Approach to Wilcox Solar Observatory and SOHO/Michelson Doppler Imager Observations", 2002, *JGR*, 107(A10), 1318-1324.
6. Zhao, X. P., Plunkett, S. M., & **Liu, W.** "Determination of Geometrical and Kinematical Properties of Halo Coronal Mass Ejection Using the Cone Model", 2002, *JGR*, 107(A8), 1223-1231.
5. Hu, Y. Q., Jiang, Y. W., & **Liu, W.** "Coronal Magnetic Flux Rope Equilibria and Magnetic Helicity", 2001, *Chinese Journal of Astronomy & Astrophysics*, 1, 77-84.
4. Hu, Y. Q., & **Liu, W.** "A 2.5-dimensional Ideal Magnetohydrodynamic Model for Coronal Magnetic Flux Ropes", 2000, *ApJ*, 540, 1119-1125.
3. **Liu, W.**, Hu, Y. Q., Xia, L. D., & Yang, Y. L. "Prominence Disturbance Caused by Magnetic Cancellation", 2000, *Chinese Astronomy and Astrophysics*, 24, 365-373.
2. Yang, Y. L., Liu, S. L., Hu, Y. Q., & **Liu**, **W.** "Numerical Study of Propagation Properties of Interplanetary Shocks", 2000, *Chinese Journal of Geophysics*, 43 (4), 435-442.
1. Chen, Y., Li, Z.Y., **Liu, W.**, & Shi, Z. D. "Solitary Kinetic Alfvén Waves in The Inertial Limit Region", 2000, *Physics of Plasmas*, 7, 371-374.

Conference Proceedings

4. **Liu, W.**, (1) "Height Dependence of X-ray Sources with Energy and Time", (2) "RHESSI Observation of Chromospheric Evaporation", 2009, to appear in *Solar Flares at High Energy: A RHESSI-inspired monograph*, Eds. B. R. Dennis, A. G. Emslie, H. S. Hudson, & R. P. Lin, *Space Science Reviews*.
3. **Liu, W.**, Zhao, X. P., Wu, S. T., & Scherrer, P. H. "Effects of Magnetic Topology on CME Kinematic Properties", 2003, in *ESA SP Series 535, the International Solar Cycle Studies (ISCS) Symposium: Solar Variability as an Input to the Earth's Environment*, Ed. A. Wilson (Noordwijk: ESA Publications Division), 459-464.
2. **Liu, W.**, Plunkett, S. P. & Zhao, X. P. "A Cone Model for Coronal Mass Ejections", 2002, in *COSPAR Colloquia Series 14, Solar-Terrestrial Magnetic Activity and Space Environment*, Eds. H. Wang & R. Xu (Boston: Pergamon), 267-269.
1. Hu, Y. Q., and **Liu**, **W.**, "Eruption of Emerged Magnetic Flux Ropes from the Photosphere", 1999, in *Proceedings of The First Franco-Chinese Meeting on Solar Physics*, Eds. C. Fang, J. C. Hénoux, M. D. Ding (Beijing: International Academic Publishers), p. 1.

Other Publications (book, dissertation, online)

4. **Liu, W.** "Solar Flares as Natural Particle Accelerators: A High-energy View from X-ray Observations and Theoretical Models" – a *monograph* published by *VDM Verlag Dr. Müller* (Saarbrücken, Germany), July 2008, ISBN: 978-3-8364-7432-0, 252 pages. (http://search.barnesandnoble.com/booksearch/isbninquiry.asp?ean=9783836474320)
3. **Liu, W.** & Petrosian, V. "Double Coronal Hard X-ray Source", *RHESSI Science Nuggets*, Oct. 2007. (online at http://sprg.ssl.berkeley.edu/~tohban/nuggets/?page=article&article_id=61)
2. **Liu, W.** "Characteristics of Solar Flare Hard X-ray Emissions: Observations and Models", Dec. 2006, Ph. D. Thesis, Stanford University (228 pages, http://sun.stanford.edu/~weiliu/thesis/wei_thesis.pdf); published by *Proquest Dissertations And Theses 2007*, Section 0212, Part 0373, AAT 3242584.
1. **Liu, W.,** Zhao, X. P., Wu, S. T., & Scherrer, P. H. "Magnetic Topologies and Two-class Coronal Mass Ejections: a Numerical Magnetohydrodynamic Study", 2005, arXiv:astro-ph/0511023

Technical and Computing Skills

Analysis of multiwavelength (white light, EUV, Hα, soft and hard X-rays, magnetic field) data from space- and ground-based solar observatories: RHESSI, GOES, SOHO/MDI, LASCO, EIT, TRACE, and Wilcox Solar Observatory (WSO)
Numerical modeling of plasma: (1) kinetic approach: Fokker-Planck calculation of particle acceleration and transport (2) fluid approach: Magnetohydrodynamics (MHD) and Hydrodynamics (HD) simulations
Wavelet analysis of time series data
Languages: IDL, Fortran, C/C++, Unix shell script, HTML
Software Packages: Solar SoftWare (SSW), Numerical Recipes, Latex, Microsoft Office
Platforms: Unix/Linux (system administrator), Windows, Macintosh