

Curriculum Vitae: William P. Abbett

Education:

B. S., 1991 (With Honor), Mathematics Michigan State University

Ph. D., 1998, Physics, Michigan State University

Experience:

Dr. William P. Abbett is an associate research physicist at the Space Sciences Laboratory at the University of California, at Berkeley. Dr. Abbett has a variety of research interests in the field of astrophysics, including the formation and evolution of magnetic fields in the convective interior of the Sun and other stars; the dynamic connection between magnetic fields existing below the visible surface of the Sun, and those observed in the solar corona; the physics of magnetically driven eruptions in the solar corona (the principal drivers of space weather here at earth); and the transport of radiation in the optically-thick layers of stellar atmospheres during flares. After receiving his B. S. in mathematics from Michigan State University in 1991, he went on to complete a Ph. D. in physics in 1998 under the supervision of Robert F. Stein. After graduation, he joined the solar theory group at the Space Sciences Laboratory, where he was promoted from postdoctoral fellow to assistant research physicist in 2000, and from assistant to associate research physicist in 2005.

Dr. Abbett has been a PI or Co-I on a number of NASA, NSF, and AFOSR contracts. With this support, he developed the parallel radiative-MHD code RADMHD, which is designed to evolve the highly stratified layers of the upper convection zone, photosphere, chromosphere, transition region and solar corona within a single computational domain. He is also a co-developer of the sub-surface anelastic MHD code ANMHD that has been used extensively to study the evolution of active region-scale magnetic fields deep in the convective interior. Dr. Abbett has been an NSF SHINE working group leader since 2004, and was recently on the scientific organizing committee for the National Solar Observatory's 24-th international workshop entitled "Subsurface and Atmospheric Influences on Solar Activity" held in early 2007. His other professional affiliations include the International Astronomical Union, the American Geophysical Union, and the American Astronomical Society.

Selected Publications:

- W. P. Abbett, "The Magnetic Connection Between the Convection Zone and Corona in the Quiet Sun", *Ap. J.*, in press (2007).
- B. T. Welsch, W. P. Abbett, M. L. DeRosa, G. H. Fisher, M. K. Georgoulis, K. Kusano, D. W. Longcope, B. Ravindra, and P. W. Schuck, "Tests and Comparisons of Velocity Inversion Techniques", *Ap. J.*, submitted (2007).
- D. J. Bercik, G. H. Fisher, C. M. Johns-Krull, W. P. Abbett and L. L. Lundquist, "Are Convective Dynamos Responsible for the Minimum X-ray Fluxes Observed in the Sun and Late-Type Main Sequence Stars?", in "Solar MHD: Theory and Observations — A High Spatial Resolution Perspective", ed. J. Leibacher, H. Uitenbroek, and R. Stein, *ASPC* **354** 127 (2006).
- W. P. Abbett and G. H. Fisher, "Active Region Magnetic Fields in the Solar Interior", in "Solar MHD: Theory and Observations — A High Spatial Resolution Perspective", ed. J. Leibacher, H. Uitenbroek, and R. Stein, *ASPC* **354** 141 (2006).
- J. C. Allred, S. L. Hawley, W. P. Abbett, and M. Carlsson "Radiative Hydrodynamic Models of Optical and Ultraviolet Emission from M Dwarf Flares", *Ap. J.* **644**, 484 (2006).
- D. J. Bercik, G. H. Fisher, C. M. Johns-Krull, and W. P. Abbett, "Convective Dynamos and the Minimum X-ray Flux in Main Sequence Stars", *Ap. J.* **631**, 529 (2005).
- J. C. Allred, S. L. Hawley, W. P. Abbett, and M. Carlsson "Radiative Hydrodynamic Models of the Optical and Ultraviolet Emission from Solar Flares", *Ap. J.* **630**, 573 (2005).

- W. P. Abbett, G. H. Fisher, Y. Fan, and D. J. Bercik, “The Dynamic Evolution of Twisted Magnetic Flux Tubes in a 3D Convecting Flow II: Turbulent Pumping and the Cohesion of Omega-Loops”, *Ap. J* **612**, 557 (2004).
- W. P. Abbett, Z. Mikic, J. A. Linker, J. M. McTiernan, T. Magara, and G. H. Fisher, “The Photospheric Boundary of Sun-to-Earth Coupled Models”, *JASTP*, **66**, 1257 (2004).
- B. T. Welsch, G. H. Fisher, W. P. Abbett, and S. Regnier, “ILCT: Recovering Photospheric Velocities from Magnetograms by Combining the Induction Equation with Local Correlation Tracking”, *Ap. J* **610**, 1148 (2004).
- W. P. Abbett and G. H. Fisher, “A Coupled Model for the Emergence of Active Region Magnetic Flux into the Solar Corona”, *Ap. J* **582**, 475 (2003).
- Y. Fan, W. P. Abbett, and G. H. Fisher, “The Dynamic Evolution of Twisted Magnetic Flux Tubes in a 3D Convecting Flow I: Uniformly Buoyant Horizontal Tubes”, *Ap. J* **582**, 1206 (2003).
- W. P. Abbett, G. H. Fisher, and Y. Fan, “The Effects of Rotation on the Evolution of Rising Omega Loops in a Stratified Model Convection Zone”, *Ap. J* **546**, 1194 (2001).
- S. B. F. Dorch, B. Gudiksen, W. P. Abbett, and Å. Nordlund, “Flux Loss of Buoyant Ropes Interacting with Convective Flows” *A&A* **380**, 734 (2001).
- W. P. Abbett, G. H. Fisher, and Y. Fan, “The Emergence of Magnetic Flux in Active Regions”, in “Recent Insights into the Physics of the Sun and Heliosphere: Highlights from SOHO and Other Space Missions”, IAU Symposium 203, 225 (2001).
- W. P. Abbett, G. H. Fisher, and Y. Fan, “The Three-Dimensional Evolution of Rising, Twisted Magnetic Flux Tubes in a Gravitationally Stratified Model Convection Zone”, *Ap. J* **540**, 548 (2000).
- G. H. Fisher, Y. Fan, D. W. Longcope, M. G. Linton, and W. P. Abbett “Magnetic Flux Tubes Inside the Sun” *Phys. of Plasmas* Vol. 7, No. 5, p. 2173 (2000).
- W. P. Abbett, S. L. Hawley, and G. H. Fisher, “Dynamic Models of Optical Emission in Impulsive Solar Flares”, *Ap. J* **521**, 906 (1999).
- W. P. Abbett, S. L. Hawley, “Dynamic Solar Flare Model Atmospheres”, in “Solar and Stellar Activity: Similarities and Differences”, *ASPC* 158, 212 (1999).
- W. P. Abbett, M. Beaver, B. Davids, D. Georgobiani, Rathbun, P., and R. F. Stein, “Solar Convection: Comparison of Numerical Simulations and Mixing Length Theory”, *Ap. J* **480**, 395 (1997).