

YUHONG FAN

EDUCATION

1993	Ph.D., Astronomy University of Hawaii
1991	M.S., Astronomy University of Hawaii
1989	B.Sc., Space Physics Beijing University, China

POST-DEGREE APPOINTMENTS

2008 - present	Senior Scientist High Altitude Observatory, NCAR
2004 - 2008	Scientist III High Altitude Observatory, NCAR
2001 - 2004	Scientist II High Altitude Observatory, NCAR
1998 - 2000	Scientist I High Altitude Observatory, NCAR
1996 - 1997	Research Associate JILA, Univ. of Colorado at Boulder
1993 - 1996	Research Associate National Solar Observatory

PROFESSIONAL ASSOCIATION AND AWARDS

American Astronomical Society

Solar Physics Division Studentship Award, 1990

Donald E. Billings Award in Astro-Geophysics Research, 1993

Peer Reviewed Publications

- Braun, D.C., Lindsey, C., Fan, Y., and Jefferies, S.M. 1992, "Local Acoustic Diagnostics of the Solar Interior." *Ap. J.* **392**, 739.
- Fan, Y., Fisher, G.H., and DeLuca, E.E. 1993, "The Origin of Morphological Asymmetries in Bipolar Active Regions", *Ap. J.*, **405**, 390.
- Canfield, R. C., de la Beaujardiere, J.-F., Fan, Y., Leka, K. D., Lites, B., McClymont, A. N., Metcalf, T. R., Mickey, D. L., and Wuelser, J.-P. 1993, "The Morphology of Flare Processes and Electric Currents in Active Regions. I. Introduction and Methods", *Ap. J.*, **411**, 362.
- Leka, K.D., Canfield, R.C., McClymont, A.N., de la Beaujardiere, J.F., Fan, Y., and Fang, T. 1993, "The Morphology of Flare Processes and Electric Currents in Active Regions. II. NOAA Active Region 5747 (October 1989)", *Ap. J.*, **411**, 370.
- Fan, Y., Fisher, G.H., and McClymont, A.N. 1994, "Dynamics of Emerging Active Region Flux Loops", *Ap. J.*, **436**, 907.
- Fisher, G.H., Fan, Y., and Howard, R.H. 1995, "Comparison Between Theory and Observation of Active Region Tilts", *Ap. J.*, **438**, 463.
- Fan, Y., Braun, D. C., and Chou, D.-Y. 1995, "Scattering of p -Modes by Sunspots II: Calculations of Phase Shifts from a Phenomenological Model", *Ap. J.*, **451**, 877.
- Fan, Y. and Fisher, G. H. 1996: "Radiative Heating and the Buoyant Rise of Magnetic Flux Tubes in the Solar Interior", *Solar Phys.*, **166**, 17.
- Lindsey, C., Braun, D. C., Jefferies, S., Woodard, M., Fan, Y., Gu, Y., and Redfield, S. 1996: "Doppler Acoustic Diagnostics of Subsurface Solar Magnetic Structure", *Ap. J.*, **470**, 636.
- DeLuca, E. E., Fan, Y., and Saar, S. H. 1997: "The Emergence of Magnetic Flux Loops in Sunlike Stars", *Ap. J.*, **481**, 369.
- Fan, Y., Zweibel, E. G., and Lantz, S. R. 1998: "Two-Dimensional Simulations of Buoyantly Rising, Interacting Magnetic Flux Tubes", *Ap. J.*, **493**, 480.
- Braun, D. C., Lindsey, C., Fan, Y., and Fagan, M. 1998: "Seismic Holography of Solar Activity", *Ap. J.*, **502**, 968
- Fan, Y., Zweibel, E. G., Linton, M. G., and Fisher, G. H. 1998: "The Rise of Kink-Unstable Magnetic Flux Tubes in the Solar Convection Zone", *Ap. J.*, **505**, L59
- Braun, D. C., and Fan, Y. 1998: "Helioseismic Measurements of the Subsurface Meridional Flow", *Ap. J.*, **508**, L105
- Lantz, S. R., and Fan, Y. 1999: "Anelastic MHD Equations for Modeling Solar and Stellar Convection Zones", *Ap. J. Supp.*, **121**, 247
- Fan, Y., Zweibel, E. G., Linton, M. G., and Fisher, G. H. 1999: "The Rise of Kink-Unstable Magnetic Flux Tubes and the Origin of δ -Configuration Sunspots", *Ap. J.*, **521**, 460
- Linton, M. G., Fisher, G. H., Dahlburg, R. B., and Fan, Y., 1999: "Relationship of the Multi-Mode Kink Instability to δ -Spot Formation", *Ap. J.*, **522**, 1190
- Linton, M. G., Fisher, G. H., Dahlburg, R. B., Fan, Y., and Longcope, D. W. 2000: "Multi-Mode Kink Instability as a Mechanism for δ -Spot Formation", *AdSpR*, **26**, 1781-1784.

- Fisher, G. H., Fan, Y., Longcope, D. W., Linton, M. G., and Pevtsov A. A. 2000: "The Solar Dynamo and Emerging Flux", *Solar Phys.*, **192**, 119
- Fan, Y., and Gong, D. 2000: "On the Twist of Emerging Flux Loops in the Solar Convection Zone", *Solar Phys.*, **192**, 141.
- Fisher, G. H., Fan, Y., Longcope, D. W., Linton, M. G., and Abbett, W. P. 2000: "Magnetic Flux Tubes Inside the Sun", *Physics of Plasmas*, **7**, 2173
- Abbett, W. P., Fisher, G. H., and Fan, Y. 2000: "The Three-dimensional Evolution of Rising, Twisted Magnetic Flux Tubes in a Gravitationally Stratified Model Convection Zone", *Ap. J.*, **540**, 548.
- Fan, Y. 2001: "Non-linear Growth of the 3D Undular Instability of a Horizontal Magnetic Layer and the Formation of Arching Flux Tubes", *Ap. J.*, **546**, 509.
- Abbett, W. P., Fisher, G. H., and Fan, Y. 2001: "The Effects of Rotation on the Evolution of Rising Ω -loops in a Stratified Model Convection Zone", *Ap. J.*, **546**, 1194.
- Fan, Y. 2001: "The Emergence of a Twisted Ω -tube into the Solar Atmosphere", *Ap. J.*, **554**, L111.
- Fong, B., Low, B.C., and Fan, Y. 2002: "Quiescent Solar Prominences and Magnetic-Energy Storage", *Ap. J.*, **571**, 987
- Zweibel, E.G., Heitsch, F., and Fan, Y. 2003: "Numerical Simulations of Magnetic Fields in Astrophysical Turbulence", in "*Turbulence and Magnetic Fields in Astrophysics*", eds. E. Falgarone & T. Passot, Springer Lecture Notes in Physics, Vol. 614, p.101
- Fan, Y., Abbett, W.P., and Fisher, G.H. 2003: "The Dynamic Evolution of Twisted Magnetic Flux Tubes in a 3D Convecting Flow. I. Uniformly Buoyant Horizontal Tubes", *Ap. J.*, **582**, 1206
- Low, B.C., Fong, B., and Fan, Y. 2003: "The Mass of a Solar Quiescent Prominence", *Ap. J.*, **594**, 1060
- Fan, Y., and Gibson, S.E. 2003: "The Emergence of a Twisted Magnetic Flux Tube into a Pre-existing Coronal Arcade", *Ap. J.*, **589**, L105
- Fan, Y., and Gibson, S.E. 2004: "Numerical Simulations of Three-dimensional Coronal Magnetic Fields Resulting from the Emergence of Twisted Magnetic Flux Tubes", *Ap. J.*, **609**, 1123
- Manchester, W., Gombosi, T., DeZeeuw, D., and Fan, Y. 2004: "Eruption of a Buoyantly Emerging Magnetic Flux Rope", *Ap. J.*, **610**, 588
- Abbett, W.P., Fisher, G.H., Fan, Y., and Bercik, D.J. 2004: "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.
- Fan, Y. 2004: "Magnetic Fields in the Solar Convection Zone", *Living Rev. Solar Phys.*, **1**, 1.[Online article], <http://www.livingreviews.org/lrsp-2004-1>
- Gibson, S. E., Fan, Y., Mandrini, C., Fisher, G., and Demoulin, P. 2004, "Observational Consequences of a Magnetic Flux Rope Emerging into the Corona", *Ap. J.*, **617**, 600.
- Leka, K. D., Fan, Y., Barnes, G. 2005: "On the Availability of Sufficient Twist in Solar Active Regions to Trigger the Kink Instability", *Ap. J.*, **626**, 1091.

- Fan, Y. 2005, "Coronal Mass Ejections as Loss of Confinement of Kinked Magnetic Flux Ropes", *Ap. J.*, **630**, 543.
- Gibson, S. E., and Fan, Y. 2006: "The Partial Expulsion of a Magnetic Flux Rope", *Ap. J.*, **637**, L65.
- Fan, Y., and Gibson S. E. 2006, "On the Nature of the X-ray Bright Core in a Stable Filament Channel", *Ap. J.*, **641**, L149.
- Li, J., Amari, T., and Fan, Y. 2006, "Resolution of the 180° Ambiguity for Non-potential Magnetic Field Configurations", *Ap. J.*, **654**, 675.
- Gibson, S. E., and Fan, Y. 2006: "Coronal prominence structure and dynamics: a magnetic flux rope interpretation", *JGR*, **111**, A12103, doi:10.1029/2006JA011871
- Gibson, S. E., Fan, Y., Török, T., and Kliem, B. 2006: The evolving sigmoid: evidence for magnetic flux ropes in the corona before, during and after CMEs, in *Solar Dynamics and its Effects on the Heliosphere and Earth*, Eds. D. Baker, B. Klecker, S. Schwartz, R. Schwenn, and R. von Steiger, *Space Science Reviews*, Vol. **124**, p.131.
- Fan, Y., and Gibson, S. E. 2007, "Onset of Coronal Mass Ejections Due to Loss of Confinement of Coronal Flux Ropes", *Ap. J.*, **668**, 1232
- Fan, Y. 2008: "The three-dimensional evolution of buoyant magnetic flux tubes in the solar convective envelope", *Ap. J.*, **676**, 680
- Fuller, J., S. E. Gibson, G. De Toma, and Y. Fan 2008: "Observing the unobservable? Modeling coronal cavity densities", *ApJ*, **678**, 515
- Gibson, S. E., and Fan, Y. 2008: "Partially ejected flux ropes: Implications for interplanetary coronal mass ejections", *JGR*, **113**, A09103, doi:10.1029/2008JA013151
- Fan, Y. 2009: "The Emergence of a Twisted Flux Tube into the Solar Atmosphere: Sunspot Rotation and the Formation of a Coronal Flux Rope", *Ap. J.*, **697**, 1529.
- Malanushenko, A., Longcope, D. W., Fan, Y. and Gibson, S. E. 2009: "Additive Self Helicity as a Kink Mode Threshold", *ApJ*, **in press**.
- Cottaar, M., and Fan, Y. 2009: "A Model of Coronal Streamers with Underlying Flux Ropes", *Ap. J.*, submitted.

Conference Papers

- Canfield, R.C., Fan, Y., Leka, K.D., McClymont, A.N. and Wuelser, J.P., 1991, "Currents and Flares in a Highly Nonpotential Active Region", in *Solar Polarimetry, Proc. of the 11th NSO/SP Summer Workshop*, ed.: November, L.J., 296.
- Fan, Y., Fisher, G.H., and DeLuca, E.E. 1993, "The Evolution of Anchored Magnetic Flux Loops in the Convective Envelope of the Sun", in *GONG 1992: Seismic Investigation of the Sun and the Stars*, ed. T.M. Brown (ASP Conf. Ser.; San Francisco: ASP), **42**, 89.
- Fisher, G. H., Fan, Y., Longcope, D. W., and Linton, M. G. 1996, "The Dynamics of Magnetic Flux Tubes in the Solar Convection Zone - A Study of Active Region Formation", in *Proc. of the IAU Colloquium No. 153*, ed.: Y. Uchida, T. Kosugi, and H. S. Hudson (Kluwer Academic Publishers), p.329.
- Fisher G. H., Longcope D. W., Linton M. G., Fan Y., and Pevtsov A. A. 1999: "The Origin and Role of Twist in Active Regions", in *Stellar Dynamos: Nonlinearity and Chaotic Flows*, ed. M. Nunez and A. Ferriz-Mas, Astronomical Society of the Pacific (San Francisco), ASP. Conf. Series vol. 178, p35
- Abbett, W. P., Fisher, G. H., and Fan, Y. 2001, "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, Vol. 203, p. 225, eds. P. Brekke, B. Fleck, and J.B. Gurman, Astronomical Society of the Pacific (San Francisco).
- Fan, Y. 2001, "Formation of Arching Flux Tubes at the Base of the Solar Convection Zone", in *Recent Insights into the Physics of the Sun and Heliosphere – Highlights from SOHO and Other Space Missions*, IAU Symposium, Vol. 203, p. 273, eds. P. Brekke, B. Fleck, and J.B. Gurman, Astronomical Society of the Pacific (San Francisco).
- Gibson, S.E., Low, B.C., Leka, K.D., Fan, Y., and Fletcher, L. 2002: "Magnetic Flux Ropes: Would We Know One If We Saw One", in *Magnetic Coupling of the Solar Atmosphere*, Proc. of IAU Colloquium 188, ESA SP-505, p.265.
- Fan, Y. and Low, B.C. 2003: "Dynamics of CME Driven by a Buoyant Prominence Flux Tube", in *Current Theoretical Models and Future High Resolution Solar Observations: Preparing for ATST*", ASP Conference Series Vol. 286, p.347, eds. A. A. Pevtsov and H. Uitenbroek.
- Fan, Y. 2004, "Dynamics of Emerging Flux Tubes", in "The Solar-B Mission and the Forefront of Solar Physics", eds. T.Sakurai and T.Sekii, ASP Conf. Ser. Vol.325, pp.47-56.
- Fan, Y., and Gibson, S. E. 2005: "Evolution of Twisted Magnetic Flux Ropes Emerging into the Solar Corona", in *Proceedings of Solar Wind 11 / SOHO 16*, "Connecting Sun and Heliosphere", Eds. T. Zurbuchen, and B. Fleck, ESA SP-592, p.241.
- Fan, Y., Gibson, S.E., Manchester, W. 2005: "The Emergence and Evolution of Twisted Magnetic Flux Ropes in the Solar Corona", in *Proceedings of the International Scientific Conference on Chromospheric and Coronal Magnetic Fields*, Eds. D. Innes, A. Lagg, S. Solanki, D. Danesy ESA SP-596, Published on CDROM, p.26.1.
- Fan, Y. 2009: "Modeling the subsurface evolution of active region flux tubes", in *Proceedings of the GONG 2008 / SOHO XXI conference on Solar-stellar dynamos as revealed by helio- and asteroseismology*, Eds. M. Dikpati and F. Hill, ASP conference series, in press.