

Bibliography

- Adriani, O., et al., New Measurement of the Antiproton-to-Proton Flux Ratio up to 100 GeV in the Cosmic Radiation, *Phys. Rev. Lett.*, 102, 051,101, 2009a.
- Adriani, O., et al., An anomalous positron abundance in cosmic rays with energies 1.5-100GeV, *Nature*, 458, 607–609, 2009b.
- Adriani, O., et al., PAMELA Results on the Cosmic-Ray Antiproton Flux from 60 MeV to 180 GeV in Kinetic Energy, *Phys. Rev. Lett.*, 105, 121,101, 2010.
- Alania, M. V., Stochastic variations of galactic cosmic rays, *Acta Physica Polonica B*, 33, 1149–1166, 2002.
- Alania, M. V., and T. V. Dzhapiashvili, The expected features of cosmic ray anisotropy due to hall-type diffusion and the comparison with experiment, in *Proc. Int. Conf. Cosmic Ray 16th*, Kyoto, Japan, vol. 3, pp. 19–24, 1979.
- Alanko-Huotari, K., I. G. Usoskin, K. Mursula, and G. A. Kovaltsov, Stochastic simulation of cosmic ray modulation including a wavy heliospheric current sheet, *J. Geophys. Res.*, 112, 8101, 2007.
- Alcaraz, J., et al., Leptons in near earth orbit, *Physics Letters B*, 484, 10–22, 2000.
- Alexandrova, O., V. Carbone, P. Veltri, and L. Sorriso-Valvo, Small-Scale Energy Cascade of the Solar Wind Turbulence, *Astrophys. J.*, 674, 1153–1157, 2008.
- Anderson, R. C., R. C. Henry, H. W. Moos, and J. L. Linsky, Ultraviolet observations of cool stars. VIII - Interstellar matter toward Procyon, *Astrophys. J.*, 226, 883–887, 1978.
- Barnes, A., Theory of magnetohydrodynamic waves - The WKB approximation revisited, *J. Geophys. Res.*, 97, 12,105, 1992.
- Barnes, A., and J. V. Hollweg, Large-amplitude hydromagnetic waves., *J. Geophys. Res.*, 79, 2302–2318, 1974.
- Batchelor, G., *The theory of homogenous turbulence*, Cambridge University Press, 1970.
- Bavassano, B., M. Dobrowolny, F. Mariani, and N. F. Ness, Radial evolution of power spectra of interplanetary Alfvénic turbulence, *J. Geophys. Res.*, 87, 3617–3622, 1982.

- Bavassano, B., E. Pietropaolo, and R. Bruno, On the evolution of outward and inward Alfvénic fluctuations in the polar wind, *J. Geophys. Res.*, 105, 15,959–15,964, 2000a.
- Bavassano, B., E. Pietropaolo, and R. Bruno, Alfvénic turbulence in the polar wind: A statistical study on cross helicity and residual energy variations, *J. Geophys. Res.*, 105, 12,697–12,704, 2000b.
- Beeck, J., G. M. Mason, D. C. Hamilton, G. Wibberenz, H. Kunow, D. Hovestadt, and B. Klecker, A multispacecraft study of the injection and transport of solar energetic particles, *Astrophys. J.*, 322, 1052–1072, 1987.
- Belcher, J. W., and L. Davis, Jr., Large-amplitude Alfvén waves in the interplanetary medium, 2., *J. Geophys. Res.*, 76, 3534–3563, 1971.
- Bieber, J. W., and W. H. Matthaeus, Cosmic Ray Pitch Angle Scattering in Dynamical Magnetic Turbulence, in *International Cosmic Ray Conference, International Cosmic Ray Conference*, vol. 3, p. 248, 1991.
- Bieber, J. W., and W. H. Matthaeus, Perpendicular diffusion and drift at intermediate cosmic-ray energies, *Astrophys. J.*, 485(2), 655–659, 1997.
- Bieber, J. W., and M. A. Pomerantz, A unified theory of cosmic ray diurnal variations, *Geophys. Res. Lett.*, 10, 920–923, 1983.
- Bieber, J. W., J. A. Earl, G. Green, H. Kunow, R. Mueller-Mellin, and G. Wibberenz, Interplanetary pitch angle scattering and coronal transport of solar energetic particles - New information from HELIOS, *J. Geophys. Res.*, 85, 2313–2323, 1980.
- Bieber, J. W., P. A. Evenson, and M. A. Pomerantz, Focusing anisotropy of solar cosmic rays, *J. Geophys. Res.*, 91, 8713–8724, 1986.
- Bieber, J. W., C. W. Smith, and W. H. Matthaeus, Cosmic-ray pitch-angle scattering in isotropic turbulence, *Astrophys. J.*, 334, 470–475, 1988.
- Bieber, J. W., J. Chen, W. H. Matthaeus, C. W. Smith, and M. A. Pomerantz, Long-term variations of interplanetary magnetic field spectra with implications for cosmic ray modulation, *J. Geophys. Res.*, 98(A3), 3585–3603, 1993.
- Bieber, J. W., W. H. Matthaeus, C. W. Smith, W. Wanner, M.-B. Kallenrode, and G. Wibberenz, Proton and electron mean free paths: The Palmer consensus revisited, *Astrophys. J.*, 420(1), 294–306, 1994.
- Bieber, J. W., W. Wanner, and W. H. Matthaeus, Dominant two-dimensional solar wind turbulence with implications for cosmic ray transport, *J. Geophys. Res.*, 101(A2), 2511–2522, 1996.
- Bieber, J. W., R. A. Burger, R. Engel, T. K. Gaisser, S. Roesler, and T. Stanev, Antiprotons at solar maximum, *Phys. Rev. Lett.*, 83, 674–677, 1999.

- Boezio, M., et al., The Cosmic-Ray Electron and Positron Spectra Measured at 1 AU during Solar Minimum Activity, *Astrophys. J.*, 532, 653–669, 2000.
- Breech, B., W. H. Matthaeus, J. Minnie, S. Oughton, S. Parhi, J. W. Bieber, and B. Bavassano, Radial evolution of cross helicity in high-latitude solar wind, *Geophys. Res. Lett.*, 32, 6103–+, doi:10.1029/2004GL022321, 2005.
- Breech, B., W. H. Matthaeus, J. Minnie, J. W. Bieber, S. Oughton, C. W. Smith, and P. A. Isenberg, Turbulence transport throughout the heliosphere, *J. Geophys. Res.*, 113, 8105, 2008.
- Breech, B., W. H. Matthaeus, S. R. Cranmer, J. C. Kasper, and S. Oughton, Electron and proton heating by solar wind turbulence, *Geophys. Res. Lett.*, 114, 9103, 2009.
- Breech, B. A., Topics in solar wind turbulence, Ph.D. thesis, University of Delaware, 2008.
- Bruno, R., and V. Carbone, The solar wind as a turbulence laboratory, *Living Rev. Solar Phys.*, 2, 2005.
- Burger, R. A., On the Theory and Application of Drift Motion of Charged Particles in Inhomogeneous Magnetic Fields, Ph.D. thesis, Potchefstroomse Universiteit vir Christelike Hoër Onderwys, R.S.A., 1987.
- Burger, R. A., Modeling Drift along the Heliospheric Wavy Neutral Sheet, *Astrophys. J.*, 760, 60, 2012.
- Burger, R. A., and M. Hattingh, Steady-state drift-dominated modulation models for galactic cosmic rays, *Astrophys. Space Sci.*, 230, 375–382, 1995.
- Burger, R. A., and M. Hitge, The effect of a Fisk-type heliospheric magnetic field on cosmic-ray modulation, *Astrophys. J. Lett.*, 617(1), L73–L76, 2004.
- Burger, R. A., and D. J. Visser, Reduction of Drift Effects due to Solar Wind Turbulence, *Astrophys. J.*, 725, 1366–1372, 2010.
- Burger, R. A., H. Moraal, and G. M. Webb, Drift theory of charged particles in electric and magnetic fields, *Astrophys. Space Sci.*, 116, 107–129, 1985.
- Burger, R. A., M. S. Potgieter, and B. Heber, Rigidity dependence of cosmic ray proton latitudinal gradients measured by the Ulysses spacecraft: Implications for the diffusion tensor, *J. Geophys. Res.*, 105(A12), 27,447–27,455, 2000.
- Burger, R. A., T. P. J. Krüger, M. Hitge, and N. E. Engelbrecht, A Fisk-Parker hybrid heliospheric magnetic field with a solar cycle dependence, *Astrophys. J.*, 674, 511–519, 2008.
- Burlaga, L. F., N. F. Ness, E. Stone, and F. B. McDonald, Voyager observations of magnetic fields and cosmic rays in the heliosheath, *J. Geophys. Res.*, 116, 12,104, 2011.

- Caballero-Lopez, R. A., H. Moraal, K. G. McCracken, and F. B. McDonald, The heliospheric magnetic field from 850 to 2000 AD inferred from ^{10}Be records, *J. Geophys. Res.*, 109(A12102), doi:10.1029/2004JA010633, 2004.
- Caballero-Lopez, R. A., H. Moraal, and F. B. McDonald, Galactic cosmic ray modulation: Effects of the solar wind termination shock and the heliosheath, *Journal of Geophysical Research (Space Physics)*, 109, 5105–+, doi:10.1029/2003JA010358, 2004a.
- Caballero-Lopez, R. A., H. Moraal, and F. B. McDonald, Galactic cosmic ray modulation: Effects of the solar wind termination shock and the heliosheath, *J. Geophys. Res.*, 109, 5105, 2004b.
- Caballero-Lopez, R. A., H. Moraal, and F. B. McDonald, The Modulation of Galactic Cosmic-ray Electrons in the Heliosheath, *Astrophys. J.*, 725, 121–127, 2010.
- Candia, J., and E. Roulet, Diffusion and drift of cosmic rays in highly turbulent magnetic fields, *J. Cosmol. Astropart. Phys.*, 10, 007, 2004.
- Casse, F., M. Lemoine, and G. Pelletier, Transport of cosmic rays in chaotic magnetic fields, *Physical Review D*, 65, 023,002, 2002.
- Chen, C. H. K., A. Mallet, T. A. Yousef, A. A. Schekochihin, and T. S. Horbury, Anisotropy of Alfvénic turbulence in the solar wind and numerical simulations, *Mon. Not. Roy. Astron. Soc.*, 415, 3219–3226, 2011.
- Chen, J., and J. W. Bieber, Cosmic-ray anisotropies and gradients in three dimensions, *Astrophys. J.*, 405, 375–389, 1993.
- Chenette, D. L., The propagation of Jovian electrons to earth, *J. Geophys. Res.*, 85, 2243–2256, 1980.
- Chenette, D. L., T. F. Conlon, K. R. Pyle, and J. A. Simpson, Observations of Jovian electrons at 1 AU throughout the 13 month Jovian synodic year, *Astrophys. J. Lett.*, 215, L95–L99, 1977.
- Cheney, E. W., and D. R. Kinkaid, *Numerical Mathematics and Computing - 4th Edition*, Gary W. Ostedt, 1999.
- Choudhuri, A. R., *The physics of fluids and plasmas*, 342–350 pp., Cambridge University Press, Cambridge, 1998.
- Chuychai, P., D. Ruffolo, W. H. Matthaeus, and J. Meechai, Trapping and Diffusive Escape of Field Lines in Two-Component Magnetic Turbulence, *Astrophys. J.*, 659, 1761–1776, doi: 10.1086/511811, 2007.
- Coburn, J. T., C. W. Smith, B. J. Vasquez, J. E. Stawarz, and M. A. Forman, The Turbulent Cascade and Proton Heating in the Solar Wind during Solar Minimum, *Astrophys. J.*, 754, 93, 2012.

- Coleman, P. J., Jr., Turbulence, Viscosity, and Dissipation in the Solar-Wind Plasma, *Astrophys. J.*, 153, 371, 1968.
- Dalla, S., et al., Properties of high heliolatitude solar energetic particle events and constraints on models of acceleration and propagation, *Geophys. Res. Lett.*, 30, 190,000–1, 2003.
- Dasso, S., L. J. Milano, W. H. Matthaeus, and C. W. Smith, Anisotropy in Fast and Slow Solar Wind Fluctuations, *Astrophys. J. Lett.*, 635, L181–L184, doi:10.1086/499559, 2005.
- Davidson, P., *Turbulence: an introduction for scientists and engineers*, Oxford University Press, 2004.
- de Kármán, T., and L. Howarth, On the Statistical Theory of Isotropic Turbulence, *Royal Society of London Proceedings Series A*, 164, 192–215, 1938.
- de Simone, N., V. di Felice, J. Gieseler, M. Boezio, M. Casolino, P. Picozza, B. Heber, and PAMELA Collaboration, Latitudinal and radial gradients of galactic cosmic ray protons in the inner heliosphere - PAMELA and Ulysses observations, *Astrophysics and Space Sciences Transactions*, 7, 425–434, 2011.
- Della Torre, S., et al., Effects of solar modulation on the cosmic ray positron fraction, *Adv. Space Res.*, 49, 1587–1592, 2012.
- Dmitruk, P., and W. H. Matthaeus, Low-frequency $1/f$ fluctuations in hydrodynamic and magnetohydrodynamic turbulence, *Physical Review E*, 76, 036,305, 2007.
- Dosch, A., A. Shalchi, and B. Weinhorst, Relation between different theories for cosmic ray cross field diffusion, *Adv. Space Res.*, 44, 1326–1336, 2009.
- Douglas, J., Alternating Direction Methods for Three Space Variables, *Numerische Mathematik*, 4, 41–63, 1962.
- Dröge, W., Transport of solar energetic particles, *Astrophys. J. Sup.*, 90, 567–576, 1994.
- Dröge, W., The rigidity dependence of solar particle scattering mean free paths, *Astrophys. J.*, 537(2), 1073–1079, 2000.
- Dröge, W., Solar particle transport in a dynamical quasi-linear theory, *Astrophys. J.*, 589, 1027–1039, 2003.
- Dröge, W., Probing heliospheric diffusion coefficients with solar energetic particles, *Adv. Space Res.*, 35, 532–542, 2005.
- Dröge, W., and Y. Y. Kartavykh, Testing transport theories with solar energetic particles, *Astrophys. J.*, 693, 69–74, 2009.
- Dröge, W., G. Wibberenz, and B. Klecker, A Dual Spacecraft Study of the Injection and Propagation of Energetic Particles Following the 7 June 1980 Gamma Ray Flares, in *International Cosmic Ray Conference*, *International Cosmic Ray Conference*, vol. 5, p. 187, 1990.

- Dröge, W., Y. Y. Kartavykh, B. Klecker, and G. A. Kovaltsov, Anisotropic Three-Dimensional Focused Transport of Solar Energetic Particles in the Inner Heliosphere, *Astrophys. J.*, 709, 912–919, 2010.
- Dunzlaff, P., B. Heber, A. Kopp, O. Rother, R. Müller-Mellin, A. Klassen, R. Gómez-Herrero, and R. Wimmer-Schweingruber, Observations of recurrent cosmic ray decreases during solar cycles 22 and 23, *Annales Geophysicae*, 26, 3127–3138, 2008.
- DuVernois, M. A., et al., Cosmic-Ray Electrons and Positrons from 1 to 100 GeV: Measurements with HEAT and Their Interpretation, *Astrophys. J.*, 559, 296–303, 2001.
- Effenberger, F., H. Fichtner, K. Scherer, S. Barra, J. Kleimann, and R. D. Strauss, A Generalized Diffusion Tensor for Fully Anisotropic Diffusion of Energetic Particles in the Heliospheric Magnetic Field, *Astrophys. J.*, 750, 108, 2012.
- Elsässer, W. M., The Hydromagnetic Equations, *Physical Review*, 79, 183, 1950.
- Engelbrecht, N. E., On the heliospheric diffusion tensor and its effect on 26-day recurrent cosmic-ray variations, Master's thesis, North-West University (Potchefstroom Campus), 2008.
- Engelbrecht, N. E., and R. A. Burger, Effects of various dissipation range onset models on the 26-day variations of low-energy galactic cosmic-ray electrons, *Adv. Space Res.*, 45, 1015–1025, 2010.
- Erdős, G., and A. Balogh, *In situ* observations of magnetic field fluctuations, *Adv. Space Res.*, 35(4), 625–635, 2005.
- Evenson, P., Cosmic Ray Electron Spectrum in 2009, in *International Cosmic Ray Conference, Beijing*, 2011.
- Evenson, P., M. Garcia-Munoz, P. Meyer, K. R. Pyle, and J. A. Simpson, A quantitative test of solar modulation theory - The proton, helium, and electron spectra from 1965 through 1979, *Astrophys. J. Lett.*, 275, L15–L18, 1983.
- Fahr, H. J., T. Kausch, and H. Scherer, A 5-fluid hydrodynamic approach to model the solar system-interstellar medium interaction, *Astron. Astrophys.*, 357, 268–282, 2000.
- Ferreira, S. E. S., The Heliospheric Transport of Galactic Cosmic Rays and Jovian Electrons, Ph.D. thesis, Potchefstroomse Universiteit vir Christelike Hoër Onderwys, R.S.A., 2002.
- Ferreira, S. E. S., M. S. Potgieter, R. A. Burger, B. Heber, and H. Fichtner, Modulation of jovian and galactic electrons in the heliosphere 1. Latitudinal transport of a few MeV electrons, *J. Geophys. Res.*, 106(A11), 24,979–24,987, 2001a.
- Ferreira, S. E. S., M. S. Potgieter, R. A. Burger, B. Heber, H. Fichtner, and C. Lopate, Modulation of Jovian and galactic electrons in the heliosphere: 2. Radial transport of a few MeV electrons, *J. Geophys. Res.*, 106, 29,313–29,322, 2001b.

- Ferreira, S. E. S., M. S. Potgieter, B. Heber, and H. Fichtner, Charge-sign dependent modulation in the heliosphere over a 22-year cycle, *Annales Geophysicae*, 21, 1359–1366, 2003.
- Ferreira, S. E. S., M. S. Potgieter, B. Heber, H. Fichtner, and G. Wibberenz, Latitudinal transport effects on the modulation of a few-MeV cosmic ray electrons from solar minimum to solar maximum, *J. Geophys. Res.*, 109(A02), 115, doi:10.1029/2003JA010032, 2004.
- Ferreira, S. E. S., K. Scherer, and M. S. Potgieter, Cosmic rays in the dynamic heliosheath, *Adv. Space Res.*, 41, 351–360, 2008.
- Fisk, L. A., Motion of the footpoints of heliospheric magnetic field lines at the Sun: Implications for recurrent energetic particle events at high heliographic latitudes, *J. Geophys. Res.*, 101, 15,547–15,553, 1996.
- Fisk, L. A., and J. R. Jokipii, Mechanisms for latitudinal transport of energetic particles in the heliosphere, *Space Sci. Rev.*, 89, 115–124, 1999.
- Florinski, V., S. E. S. Ferreira, and N. V. Pogorelov, Galactic Cosmic Rays in the Outer Heliosphere: Theory and Models, *Space Sci. Rev.*, p. 111, 2011.
- Ford, T., I. D. Palmer, and R. Sanders, Separation of solar and interplanetary diffusion in solar cosmic ray events, *J. Geophys. Res.*, 82, 4704–4710, 1977.
- Forman, M. A., The Compton-Getting effect for cosmic-ray particles and photons and the Lorentz-invariance of distribution functions, *Planet. Space Sci.*, 18, 25–+, 1970.
- Forman, M. A., J. R. Jokipii, and A. J. Owens, Cosmic-ray streaming perpendicular to the mean magnetic field, *Astrophys. J.*, 192(2), 535–540, 1974.
- Forman, M. A., R. T. Wicks, and T. S. Horbury, Detailed fit of ‘critical balance’ theory to solar wind turbulence measurements, *Astrophys. J.*, 733, 76–83, 2011.
- Forsyth, R. J., T. S. Horbury, A. Balogh, and E. J. Smith, Hourly variances of fluctuations in the heliospheric magnetic field out of the ecliptic plane, *Geophys. Res. Lett.*, 23, 595–598, doi: 10.1029/96GL00416, 1996.
- Forsyth, R. J., A. Balogh, and E. J. Smith, The underlying direction of the heliospheric magnetic field through the Ulysses first orbit, *J. Geophys. Res.*, 107(A11), 1405, doi: 10.1029/2001JA005056, 2002.
- Fuselier, S. A., et al., Width and Variation of the ENA Flux Ribbon Observed by the Interstellar Boundary Explorer, *Science*, 326, 962–964, 2009.
- Gazis, P. R., A. Barnes, J. D. Mihalov, and A. J. Lazarus, Solar wind velocity and temperature in the outer heliosphere, *J. Geophys. Res.*, 99(A4), 6561–6573, 1994.
- Giacalone, J., Particle transport and acceleration at corotating interaction regions, *Adv. Space Res.*, 23(3), 581–590, 1999a.

- Giacalone, J., Particle transport and acceleration at corotating interaction regions, *Adv. Space Res.*, 23, 581–590, 1999b.
- Giacalone, J., and J. R. Jokipii, The transport of cosmic rays across a turbulent magnetic field, *Astrophys. J.*, 520(1), 204–214, 1999.
- Giacalone, J., J. R. Jokipii, and J. Kóta, Particle drifts in a fluctuating magnetic field, in *Proc. Int. Conf. Cosmic Ray 26th*, Salt Lake City, U.S.A., vol. 7, pp. 37–40, 1999.
- Gleeson, L. J., and W. I. Axford, Cosmic rays in the interplanetary medium, *Astrophys. J. Lett.*, 149(3), L115–L118, 1967.
- Gleeson, L. J., and W. I. Axford, Solar modulation of galactic cosmic rays, *Astrophys. J.*, 154, 1011, 1968.
- Gleeson, L. J., and I. H. Urch, A study of the force-field equation for the propagation of galactic cosmic rays, *Astrophys. Space Sci.*, 25, 387–404, doi:10.1007/BF00649180, 1973.
- Goldreich, P., and S. Sridhar, Toward a theory of interstellar turbulence. 2: Strong alfvénic turbulence, *Astrophys. J.*, 438, 763–775, 1995.
- Goldstein, B. E., E. J. Smith, A. Balogh, T. S. Horbury, M. L. Goldstein, and D. A. Roberts, Properties of magnetohydrodynamic turbulence in the solar wind as observed by Ulysses at high heliographic latitudes, *Geophys. Res. Lett.*, 22, 3393–3396, 1995b.
- Goldstein, M. L., Major Unsolved Problems in Space Plasma Physics, *Astrophys. Space Sci.*, 277, 349–369, 2001.
- Goldstein, M. L., and D. A. Roberts, Magnetohydrodynamic turbulence in the solar wind, *Physics of Plasmas*, 6, 4154–4160, 1999.
- Goldstein, M. L., D. A. Roberts, and C. A. Fitch, Properties of the fluctuating magnetic helicity in the inertial and dissipation ranges of solar wind turbulence, *J. Geophys. Res.*, 99, 11,519–11,538, 1994.
- Goldstein, M. L., D. A. Roberts, and W. H. Matthaeus, Magnetohydrodynamic Turbulence In The Solar Wind, *Annu. Rev. Astron. Astrophys.*, 33, 283–326, doi: 10.1146/annurev.aa.33.090195.001435, 1995a.
- Gosling, J. T., and V. J. Pizzo, Formation and Evolution of Corotating Interaction Regions and their Three Dimensional Structure, *Space Sci. Rev.*, 89, 21–52, 1999.
- Gradshteyn, I. S., and I. M. Ryzhik, *Table of Integrals, Series, and Products - 7th Edition*, Academic Press, 2007.
- Gry, C., and E. B. Jenkins, Local clouds: Ionization, temperatures, electron densities and interfaces, from GHRS and IMAPS spectra of epsilon Canis Majoris, *Astron. Astrophys.*, 367, 617–628, 2001.

- Hamilton, D. C., The radial transport of energetic solar flare particles from 1 to 6 AU, *J. Geophys. Res.*, 82, 2157–2169, 1977.
- Hamilton, K., C. W. Smith, B. J. Vasquez, and R. J. Leamon, Anisotropies and helicities in the solar wind inertial and dissipation ranges at 1 AU, *J. Geophys. Res.*, 113, 1106, 2008.
- Hattingh, M., The modulation of galactic cosmic rays in a three-dimensional heliosphere, Ph.D. thesis, Potchefstroomse Universiteit vir Christelike Hoër Onderwys, R.S.A., 1998.
- Hattingh, M., and R. A. Burger, A new simulated wavy neutral sheet drift model, *Adv. Space Res.*, 16(9), 213–216, 1995.
- Heber, B., and R. A. Burger, Modulation of galactic cosmic rays at solar minimum, *Space Sci. Rev.*, 89, 125–138, 1999.
- Heber, B., J. Gieseler, P. Dunzlaff, R. Gómez-Herrero, A. Klassen, R. Müller-Mellin, R. A. Mewaldt, M. S. Potgieter, and S. E. S. Ferreira, Latitudinal Gradients of Galactic Cosmic Rays during the 2007 Solar Minimum, *Astrophys. J.*, 689, 1443–1447, 2008.
- Heber, B., et al., Spatial variation of > 40 MeV/n nuclei fluxes observed during the Ulysses rapid latitude scan, *Astron. Astrophys.*, 316, 538–546, 1996.
- Hedgecock, P. C., Measurements of the interplanetary magnetic field in relation to the modulation of cosmic rays, *Solar Physics*, 42, 497–527, 1975.
- Hitge, M., and R. A. Burger, Cosmic ray modulation with a Fisk-type heliospheric magnetic field and a latitude-dependent solar wind speed, *Adv. Space Res.*, 45, 18–27, 2010.
- Hollweg, J. V., Transverse Alfvén waves in the solar wind: Arbitrary k , v_0 , B_0 , and $|\delta B|$, *J. Geophys. Res.*, 79, 1539, 1974.
- Horbury, T., R. R.T. Wicks, and C. Chen, Anisotropy in space plasma turbulence: Solar wind observations, *Space Sci. Rev.*, 2011.
- Horbury, T. S., and A. Balogh, Evolution of magnetic field fluctuations in high-speed solar wind streams: Ulysses and Helios observations, *J. Geophys. Res.*, 106, 15,929–15,940, 2001.
- Horbury, T. S., A. Balogh, R. J. Forsyth, and E. J. Smith, Anisotropy of inertial range turbulence in the polar heliosphere, *Geophys. Res. Lett.*, 22, 3405–3408, doi:10.1029/95GL03012, 1995.
- Horbury, T. S., A. Balogh, R. J. Forsyth, and E. Smith, The rate of turbulent evolution over the Sun's poles, *Astron. Astrophys.*, 316, 333–341, 1996.
- Howes, G. G., S. C. Cowley, W. Dorland, G. W. Hammett, E. Quataert, and A. A. Schekochihin, A model of turbulence in magnetized plasmas: Implications for the dissipation range in the solar wind, *J. Geophys. Res.*, 113, 5103, 2008.
- Hunana, P., and G. P. Zank, Inhomogeneous Nearly Incompressible Description of Magneto-hydrodynamic Turbulence, *Astrophys. J.*, 718, 148–167, 2010.

- Iroshnikov, P. S., Turbulence of a Conducting Fluid in a Strong Magnetic Field, *Sov. Astron.*, 7, 566, 1963.
- Isenberg, P. A., Turbulence-driven Solar Wind Heating and Energization of Pickup Protons in the Outer Heliosphere, *Astrophys. J.*, 623, 502–510, 2005.
- Isenberg, P. A., and J. R. Jokipii, Effects of particle drift on cosmic ray transport. II. Analytical solution to the modulation problem with no latitudinal diffusion, *Astrophys. J.*, 219, 740–749, 1978.
- Isenberg, P. A., C. W. Smith, and W. H. Matthaeus, Turbulent Heating of the Distant Solar Wind by Interstellar Pickup Protons, *Astrophys. J.*, 592, 564–573, 2003.
- Isenberg, P. A., C. W. Smith, and W. H. Matthaeus, Turbulent heating of the distant solar wind by interstellar pickup protons, *Astrophys. J.*, 592(1), 564–573, 2003.
- Isenberg, P. A., C. W. Smith, W. H. Matthaeus, and J. D. Richardson, Turbulent Heating of the Distant Solar Wind by Interstellar Pickup Protons in a Decelerating Flow, *Astrophys. J.*, 719, 716–721, 2010.
- Jokipii, J. R., Cosmic-ray propagation. I. Charged particles in a random magnetic field, *Astrophys. J.*, 146(2), 480–487, 1966.
- Jokipii, J. R., Particle drifts for a finite scattering rate, in *International Cosmic Ray Conference*, 1993.
- Jokipii, J. R., Latitudinal heliospheric magnetic field: Stochastic and causal components, *J. Geophys. Res.*, 106, 15,841–15,848, doi:10.1029/2000JA000116, 2001.
- Jokipii, J. R., Solar System: A shock for Voyager 2, *Nature*, 454, 38–39, 2008.
- Jokipii, J. R., and D. A. Kopriva, Effects of particle drift on the transport of cosmic rays. III. Numerical models of galactic cosmic-ray modulation, *Astrophys. J.*, 234, 384–392, 1979.
- Jokipii, J. R., and J. Kóta, The polar heliospheric magnetic field, *Geophys. Res. Lett.*, 16, 1–4, 1989.
- Jokipii, J. R., and E. H. Levy, Effects of particle drifts on the solar modulation of galactic cosmic rays, *Astrophys. J.*, 213, L85–L88, 1977.
- Jokipii, J. R., and E. N. Parker, Stochastic Aspects of Magnetic Lines of Force with Application to Cosmic-Ray Propagation, *Astrophys. J.*, 155, 777, 1969.
- Jokipii, J. R., and E. N. Parker, On the convection, diffusion, and adiabatic deceleration of cosmic rays in the solar wind, *Astrophys. J.*, 160, 735, 1970.
- Jokipii, J. R., and B. Thomas, Effects of drift on the transport of cosmic rays. IV - Modulation by a wavy interplanetary current sheet, *Astrophys. J.*, 243(1), 1115–1122, 1981.
- Jokipii, J. R., E. H. Levy, and W. B. Hubbard, Effects of particle drift on cosmic-ray transport. I - General properties, application to solar modulation, *Astrophys. J.*, 213, 861–868, 1977.

- Jokipii, J. R., J. Kóta, and J. Giacalone, Perpendicular transport in 1- and 2-dimensional shock simulations, *Geophys. Res. Lett.*, 20(17), 1759–1761, 1993.
- Jokipii, J. R., J. Kóta, J. Giacalone, T. S. Horbury, and E. J. Smith, Interpretation and consequences of large-scale magnetic variances observed at high heliographic latitude, *Geophys. Res. Lett.*, 22, 3385–3388, doi:10.1029/95GL03458, 1995.
- Jokipii, J. R., J. Kóta, J. Giacalone, T. S. Horbury, and E. J. Smith, Interpretation and consequences of large-scale magnetic variances observed at high heliographic latitude, *Geophys. Res. Lett.*, 22, 3385–3388, 1995.
- Kane, S. R., P. Evenson, and P. Meyer, Acceleration of interplanetary solar electrons in the 1982 August 14 flare, *Astrophys. J. Lett.*, 299, L107–L110, 1985.
- Kelly, J., S. Dalla, and T. Laitinen, Cross-field transport of solar energetic particles in a large-scale fluctuating magnetic field, *Astrophys. J.*, 750, 47, 2012.
- Klein, L. W., L. F. Burlaga, and N. F. Ness, Radial and latitudinal variations of the interplanetary magnetic field, *J. Geophys. Res.*, 92, 9885–9892, 1987.
- Kobylnski, Z., Comparison of the Fisk magnetic field with the standard Parker IMF: Consequences for diffusion coefficients, *Adv. Space Res.*, 27(3), 541–546, 2001.
- Kojima, M., H. Washimi, H. Misawa, and K. Hakamada, *Solar wind observed within 0.3 AU with interplanetary scintillation*, in *Solar Wind Seven*, edited by E. Marsch and R. Schwenn, 201–204 pp., Pergamon Press, New York, 1991.
- Kolmogorov, A., The Local Structure of Turbulence in Incompressible Viscous Fluid for Very Large Reynolds' Numbers, *Akademiia Nauk SSSR Doklady*, 30, 301–305, 1941.
- Kóta, J., Drift - the essential process in losing energy, in *Proc. Int. Conf. Cosmic Ray 16th*, Kyoto, Japan, vol. 3, p. 13, 1979.
- Kóta, J., and J. R. Jokipii, Effects of drift on the transport of cosmic rays. VI - A three-dimensional model including diffusion, *Astrophys. J.*, 265(1), 73–581, 1983.
- Kóta, J., and J. R. Jokipii, Corotating Variations of Cosmic Rays Near the South Heliospheric Pole, *Science*, 268, 1024–1025, 1995a.
- Kóta, J., and J. R. Jokipii, Modeling of 3-D Corotating Cosmic-Ray Structures in the Heliosphere, *Space Sci. Rev.*, 83, 137–145, 1998.
- Kóta, J., and J. R. Jokipii, Velocity correlation and the spatial diffusion coefficients of cosmic rays: compound diffusion, *Astrophys. J.*, 531(2), 1067–1070, 2000.
- Kóta, J., and J. R. Jokipii, 3-D modeling of cosmic-ray transport in the heliosphere: toward solar maximum, *Adv. Space Res.*, 27(3), 529–534, 2001.

- Kraichnan, R. H., Inertial-Range Spectrum of Hydromagnetic Turbulence, *Physics of Fluids*, 8, 1385–1387, 1965.
- Kunow, H., et al., High energy cosmic-ray nuclei results on Ulysses: 2. Effects of a recurrent high-speed stream from the southern polar coronal hole, *Space Sci. Rev.*, 72, 397–402, 1995.
- Langner, U. W., Effects of termination shock acceleration on cosmic rays in the heliosphere, Ph.D. thesis, Potchefstroomse Universiteit vir Christelike Hoër Onderwys, R.S.A., 2004.
- Langner, U. W., and M. S. Potgieter, Solar wind termination shock and heliosheath effects on the modulation of protons and antiprotons, *J. Geophys. Res.*, 109, 1103, 2004.
- Langner, U. W., O. C. de Jager, and M. S. Potgieter, On the local interstellar spectrum for cosmic ray electrons, *Adv. Space Res.*, 27, 517–522, 2001.
- le Roux, J. A., The Effect of Intermittent Gyro-scale Slab Turbulence on Parallel and Perpendicular Cosmic-Ray Transport, *Astrophys. J.*, 743, 72, 2011.
- le Roux, J. A., and G. M. Webb, Nonlinear Cosmic-Ray Diffusive Transport in Combined Two-dimensional and Slab Magnetohydrodynamic Turbulence: A BGK-Boltzmann Approach, *Astrophys. J.*, 667, 930–955, 2007.
- Le Roux, J. A., G. P. Zank, and V. S. Ptuskin, An evaluation of perpendicular diffusion models regarding cosmic ray modulation on the basis of a hydromagnetic description for solar wind turbulence, *J. Geophys. Res.*, 104(A11), 24,845–24,862, 1999.
- le Roux, J. A., G. M. Webb, A. Shalchi, and G. P. Zank, A Generalized Nonlinear Guiding Center Theory for the Collisionless Anomalous Perpendicular Diffusion of Cosmic Rays, *Astrophys. J.*, 716, 671–692, 2010.
- Leamon, R. J., C. W. Smith, N. F. Ness, W. H. Matthaeus, and H. K. Wong, Observational constraints on the dynamics of the interplanetary magnetic field dissipation range, *J. Geophys. Res.*, 103, 4775–4782, 1998a.
- Leamon, R. J., C. W. Smith, and N. F. Ness, Characteristic of magnetic fluctuations within coronal mass ejections: the January 1997 event, *Geophys. Res. Lett.*, 25, 2505–2508, 1998b.
- Leamon, R. J., W. H. Matthaeus, C. W. Smith, G. P. Zank, D. J. Mullan, and S. Oughton, MHD-driven kinetic dissipation in the solar wind and corona, *Astrophys. J.*, 537, 1054–1062, 2000.
- Lee, M. A., and W.-H. Ip, Hydromagnetic wave excitation by ionised interstellar hydrogen and helium in the solar wind, *J. Geophys. Res.*, 92, 11,041–11,052, 1987.
- L'Heureux, J., and P. Meyer, Quiet-time increases of low-energy electrons - The Jovian origin, *Astrophys. J.*, 209, 955–960, 1976.
- Lin, R. P., Observations of scatter-free propagation of 40-keV solar electrons in interplanetary medium., *J. Geophys. Res.*, 75, 2583–2586, 1970.

- Lin, R. P., Non-relativistic Solar Electrons, *Space Sci. Rev.*, 16, 189–256, 1974.
- Lin, R. P., Energetic solar electrons in the interplanetary medium, *Solar Physics*, 100, 537–561, 1985.
- Lionello, R., J. A. Linker, Z. Mikić, and P. Riley, The Latitudinal Excursion of Coronal Magnetic Field Lines in Response to Differential Rotation: MHD Simulations, *Astrophys. J. Lett.*, 642, L69–L72, doi:10.1086/504289, 2006.
- Lockwood, J. A., and W. R. Webber, Intensities of galactic cosmic rays of ~ 1.5 GV rigidity at Earth versus the heliospheric current sheet tilt, *J. Geophys. Res.*, 110, 4102, 2005.
- Lupton, J. E., and E. C. Stone, Solar flare particle propagation: Comparison of a new analytic solution with spacecraft measurements., *J. Geophys. Res.*, 78, 1007–1018, 1973.
- Ma Sung, L. S., and J. A. Earl, Interplanetary propagation of flare-associated energetic particles, *Astrophys. J.*, 222, 1080–1096, 1978.
- MacBride, B. T., C. W. Smith, and B. J. Vasquez, Inertial-range anisotropies in the solar wind from 0.3 to 1 AU: Helios 1 observations, *J. Geophys. Res.*, 115, 7105, 2010.
- Mace, R. L., W. H. Matthaeus, and J. W. Bieber, Numerical investigation of perpendicular diffusion of charged test particles in weak magnetostatic slab turbulence, *Astrophys. J.*, 538(1), 192–202, 2000.
- Maeno, T., et al., Successive measurements of cosmic-ray antiproton spectrum in a positive phase of the solar cycle, *Astroparticle Physics*, 16, 121–128, 2001.
- Manuel, R., S. E. S. Ferreira, M. S. Potgieter, R. D. Strauss, and N. E. Engelbrecht, Time-dependent cosmic ray modulation, *Adv. Space Res.*, 47, 1529–1537, 2011.
- Marsch, E., *MHD Turbulence in the Solar Wind*, pp. 159–241, 1991.
- Marsch, E., Kinetic Physics of the Solar Corona and Solar Wind, *Living Reviews in Solar Physics*, 3, 1, 2006.
- Matthaeus, W. H., and M. L. Goldstein, Measurement of the rugged invariants of magnetohydrodynamic turbulence in the solar wind, *J. Geophys. Res.*, 87, 6011–6028, 1982.
- Matthaeus, W. H., and M. Velli, Who needs turbulence? A review of turbulence effects in the heliosphere and on the fundamental process of reconnection, *Space Sci. Rev.*, 160, 145–168, 2011.
- Matthaeus, W. H., M. L. Goldstein, and C. Smith, Evaluation of magnetic helicity in homogeneous turbulence, *Phys. Rev. Lett.*, 48, 1256–1259, 1982.
- Matthaeus, W. H., M. L. Goldstein, and D. A. Roberts, Evidence for the presence of quasi-two-dimensional nearly incompressible fluctuations in the solar wind, *J. Geophys. Res.*, 95, 20,673–20,683, 1990.

- Matthaeus, W. H., Y. Zhou, G. P. Zank, and S. Oughton, Transport theory and the WKB approximation for interplanetary MHD fluctuations, *J. Geophys. Res.*, 99, 23,421, 1994.
- Matthaeus, W. H., P. C. Gray, D. H. Pontius Jr., and J. W. Bieber, Spatial structure and field-line diffusion in transverse magnetic turbulence, *Phys. Rev. Lett.*, 75(11), 2136–2139, 1995.
- Matthaeus, W. H., G. P. Zank, C. W. Smith, and S. Oughton, Turbulence, spatial transport, and heating of the solar wind, *Phys. Rev. Lett.*, 82, 3444–3447, 1999a.
- Matthaeus, W. H., C. W. Smith, and J. W. Bieber, Correlation lengths, the Ultrascale, and the spatial structure of interplanetary turbulence, in *American Institute of Physics Conference Series*, *American Institute of Physics Conference Series*, vol. 471, edited by S. T. Suess, G. A. Gary, & S. F. Nerney, pp. 511–514, 1999b.
- Matthaeus, W. H., G. Qin, J. W. Bieber, and G. P. Zank, Nonlinear collisionless perpendicular diffusion of charged particles, *Astrophys. J. Lett.*, 590(1), L53–L56, 2003.
- Matthaeus, W. H., J. Minnie, B. Breech, S. Parhi, J. W. Bieber, and S. Oughton, Transport of cross helicity and radial evolution of Alfvénicity in the solar wind, *Geophys. Res. Lett.*, 31, 12,803, 2004.
- Matthaeus, W. H., S. Dasso, J. M. Weygand, L. J. Milano, C. W. Smith, and M. G. Kivelson, Spatial Correlation of Solar-Wind Turbulence from Two-Point Measurements, *Phys. Rev. Lett.*, 95, 231,101, 2005.
- Matthaeus, W. H., J. W. Bieber, D. Ruffolo, P. Chuychai, and J. Minnie, Spectral Properties and Length Scales of Two-dimensional Magnetic Field Models, *Astrophys. J.*, 667, 956–962, doi:10.1086/520924, 2007.
- Matthaeus, W. H., D. C. Montgomery, M. Wan, and S. Servidio, A review of relaxation and structure in some turbulent plasmas: magnetohydrodynamics and related models, *Journal of Turbulence*, 13, 37, 2012.
- McCarthy, J., and J. J. O’Gallagher, The radial variation of solar flare proton anisotropies observed in deep space on Pioneers 10 and 11, *Geophys. Res. Lett.*, 3, 53–56, 1976.
- McComas, D. J., H. A. Elliott, N. A. Schwadron, J. T. Gosling, R. M. Skoug, and B. E. Goldstein, The three-dimensional solar wind around solar maximum, *Geophys. Res. Lett.*, 30, 1517, 2003.
- McComas, D. J., et al., Solar wind observations over Ulysses’ first full polar orbit, *J. Geophys. Res.*, 105, 10,419–10,434, 2000.
- McDonald, F. B., H. Moraal, J. P. L. Reinecke, N. Lal, and R. E. McGuire, The cosmic radiation in the heliosphere at successive solar minima, *J. Geophys. Res.*, 97, 1557–1570, 1992.
- Michalek, G., and M. Ostrowsky, Cosmic ray momentum diffusion in the presence of nonlinear Alfvén waves, *Nonlinear Processes in Geophysics*, 3, 66–76, 1996.

- Milano, L. J., S. Dasso, W. H. Matthaeus, and C. W. Smith, Spectral Distribution of the Cross Helicity in the Solar Wind, *Phys. Rev. Lett.*, 93, 155,005, 2004.
- Minnie, J., An ab initio approach to the heliospheric modulation of galactic cosmic rays, Ph.D. thesis, North-West University, 2006.
- Minnie, J., R. A. Burger, S. Parhi, J. W. Bieber, and W. H. Matthaeus, The effect of solar cycle dependent heliospheric turbulence on cosmic ray modulation, *Adv. Space Res.*, 32, 567–572, 2003.
- Minnie, J., R. A. Burger, S. Parhi, W. H. Matthaeus, and J. W. Bieber, Comparison of the effects of two models for perpendicular diffusion on cosmic-ray latitudinal gradients, *Advances in Space Research*, 35, 543–546, doi:10.1016/j.asr.2004.12.001, 2005.
- Minnie, J., J. W. Bieber, W. H. Matthaeus, and R. A. Burger, On the ability of different diffusion theories to account for directly simulated diffusion coefficients, *Astrophys. J.*, 663, 1049–1054, doi:10.1086/518765, 2007a.
- Minnie, J., J. W. Bieber, W. H. Matthaeus, and R. A. Burger, Suppression of Particle Drifts by Turbulence, *Astrophys. J.*, 670, 1149–1158, 2007b.
- Moraal, H., Cosmic-Ray Modulation Equations, *Space Sci. Rev.*, p. 291, 2011.
- Moraal, H., and M. S. Potgieter, Solutions of the spherically-symmetric cosmic-ray transport equation in interplanetary space, *Astrophys. Space Sci.*, 84, 519–533, 1982.
- Moses, D., Jovian electrons at 1 AU - 1978-1984, *Astrophys. J.*, 313, 471–486, 1987.
- Moskalenko, I. V., A. W. Strong, J. F. Ormes, and M. S. Potgieter, Secondary Antiprotons and Propagation of Cosmic Rays in the Galaxy and Heliosphere, *Astrophys. J.*, 565, 280–296, 2002.
- Moskalenko, I. V., A. W. Strong, S. G. Mashnik, and J. F. Ormes, Challenging Cosmic-Ray Propagation with Antiprotons: Evidence for a “Fresh” Nuclei Component?, *Astrophys. J.*, 586, 1050–1066, 2003.
- Müller-Mellin, R., and G. Wibberenz, Energetic particles at high latitudes, *Space Sci. Rev.*, 72, 273–284, 1995.
- Narita, Y., K.-H. Glassmeier, F. Sahraoui, and M. L. Goldstein, Wave-Vector Dependence of Magnetic-Turbulence Spectra in the Solar Wind, *Phys. Rev. Lett.*, 104, 171,101, 2010.
- Narita, Y., K. H. Glassmeier, M. L. Goldstein, U. Motschmann, and F. Sahraoui, Three-dimensional spatial structures of solar wind turbulence from 10 000-km to 100-km scales, *Annales Geophysicae*, 29, 1731–1738, 2011.
- Opher, M., E. C. Stone, and P. C. Liewer, The Effects of a Local Interstellar Magnetic Field on Voyager 1 and 2 Observations, *Astrophys. J. Lett.*, 640, L71–L74, 2006.

- Orito, S., et al., Precision Measurement of Cosmic-Ray Antiproton Spectrum, *Phys. Rev. Lett.*, *84*, 1078–1081, 2000.
- Osman, K. T., and T. S. Horbury, Multispacecraft Measurement of Anisotropic Correlation Functions in Solar Wind Turbulence, *Astrophys. J. Lett.*, *654*, L103–L106, doi:10.1086/510906, 2007.
- Osman, K. T., and T. S. Horbury, Multi-spacecraft measurement of anisotropic power levels and scaling in solar wind turbulence, *Annales Geophysicae*, *27*, 3019–3025, 2009.
- Oughton, S., and W. H. Matthaeus, Linear Transport of Solar Wind Fluctuations, *J. Geophys. Res.*, *100*, 14,783–14,799, 1995.
- Oughton, S., E. Priest, and W. H. Matthaeus, The influence of a mean magnetic field on three-dimensional MHD turbulence, *J. Fluid Mech.*, *280*, 95–117, 1994.
- Oughton, S., P. Dmitruk, and W. H. Matthaeus, Reduced Magnetohydrodynamics and parallel spectral transfer, *Physics of Plasmas*, *11*, 2214–2225, 2004.
- Oughton, S., W. H. Matthaeus, and P. Dmitruk, A two-component phenomenology for homogeneous magnetohydrodynamic turbulence, *Physics of Plasmas*, *13*, 042,306, 2006.
- Oughton, S., W. H. Matthaeus, C. W. Smith, B. Breech, and P. A. Isenberg, Transport of solar wind fluctuations: A two-component model, *J. Geophys. Res.*, *116*, 8105, 2011.
- Paizis, C., B. Heber, A. Raviart, M. S. Potgieter, P. Ferrando, and R. Müller-Mellin, Compton-Getting factor and latitude variation of cosmic-rays, in *Proc. Int. Conf. Cosmic Ray 25th*, Durban, South Africa, vol. 2, pp. 93–96, 1997.
- Paizis, C., et al., Amplitude evolution and rigidity dependence of the 26-day recurrent cosmic ray decreases: COSPIN/KET results, *J. Geophys. Res.*, *104*(A12), 28,241–28,247, 1999.
- Palmer, I. D., Transport coefficients of low-energy cosmic rays in interplanetary space, *Rev. Geophys. Space Phys.*, *20*(2), 335–351, 1982.
- Palmer, I. D., and J. R. Jokipii, Interpretation of anisotropy in corotating events, *J. Geophys. Res.*, *87*, 5991–6001, 1982.
- Palmer, I. D., R. A. R. Palmeira, and F. R. Allum, Monte Carlo model of the highly anisotropic solar proton event of 20 April 1971, *Solar Physics*, *40*, 449–460, 1975.
- Palmer, I. D., R. D. Zwickl, W. R. Webber, and F. B. McDonald, Spectrum of mean free paths near earth in the solar cosmic ray event of April 29, 1973, *J. Geophys. Res.*, *83*, 2461–2475, 1978.
- Parhi, S., R. A. Burger, J. Minnie, J. W. Bieber, and W. H. Matthaeus, Effect of pick-up ions on the magnetic field correlation length: Implications for solar modulation of galactic cosmic rays, *Advances in Space Research*, *32*, 573–578, doi:10.1016/S0273-1177(03)00363-6, 2003.

- Parker, E. N., Dynamics of the interplanetary gas and magnetic fields, *Astrophys. J.*, 128, 664–676, 1958.
- Parker, E. N., The passage of energetic charged particles through interplanetary space, *Planet. Space Sci.*, 13, 9–49, 1965a.
- Parker, E. N., Dynamical Theory of the Solar Wind, *Space Sci. Rev.*, 4, 666–708, 1965b.
- Peaceman, D. W., and H. H. Rachford, The Numerical Solution of Parabolic and Elliptic Differential Equations, *Journal of the Society for Industrial and Applied Mathematics*, 3, 28–41, 1955.
- Pei, C., J. W. Bieber, B. Breech, R. A. Burger, J. Clem, and W. H. Matthaeus, Cosmic ray diffusion tensor throughout the heliosphere, *J. Geophys. Res.*, 115, 3103, 2010a.
- Pei, C., J. W. Bieber, R. A. Burger, and J. Clem, A general time-dependent stochastic method for solving Parker’s transport equation in spherical coordinates, *J. Geophys. Res.*, 115, 12,107, 2010b.
- Pei, C., J. W. Bieber, R. A. Burger, and J. Clem, Three-dimensional Wavy Heliospheric Current Sheet Drifts, *Astrophys. J.*, 744, 170, 2012.
- Perri, S., and A. Balogh, Differences in solar wind cross-helicity and residual energy during the last two solar minima, *Geophys. Res. Lett.*, 37, 17,102, 2010.
- Petrosyan, A., A. Balogh, M. L. Goldstein, J. Léorat, E. Marsch, K. Petrovay, B. Roberts, R. von Steiger, and J. C. Vial, Turbulence in the Solar Atmosphere and Solar Wind, *Space Sci. Rev.*, 156, 135–238, 2010.
- Phillips, J. L., et al., Ulysses solar wind plasma observations from pole to pole, *Geophys. Res. Lett.*, 22, 3301–3304, 1995.
- Podesta, J. J., On the energy cascade rate of solar wind turbulence in high cross helicity flows, *J. Geophys. Res.*, 116, 5101, 2011.
- Pogorelov, N. V., J. Heerikhuisen, G. P. Zank, S. N. Borovikov, P. C. Frisch, and D. J. McComas, Interstellar Boundary Explorer Measurements and Magnetic Field in the Vicinity of the Heliopause, *Astrophys. J.*, 742, 104, 2011.
- Potgieter, M. S., Heliospheric modulation of galactic electrons: Consequences of new calculations for the mean free path of electrons between 1 MeV and 10 GeV, *J. Geophys. Res.*, 101, 24,411–24,422, doi:10.1029/96JA02445, 1996.
- Potgieter, M. S., and S. E. S. Ferreira, The importance of perpendicular diffusion in the heliospheric modulation of cosmic ray electrons, *Adv. Space Res.*, 23, 463–466, 1999.
- Potgieter, M. S., and H. Moraal, A drift model for the modulation of galactic cosmic rays, *Astrophys. J.*, 294, 425–440, 1985.

- Potgieter, M. S., U. W. Langner, and S. E. S. Ferreira, Cosmic ray electron to positron ratios in the heliosphere, *Advances in Space Research*, 27, 523–528, 2001.
- Qin, G., Charged particle transport in magnetic field turbulence and study of TRIM simulation and SSX experiment, Ph.D. thesis, University of Delaware, 2002.
- Qin, G., and A. Shalchi, Numerical investigation of the influence of large turbulence scales on the parallel and perpendicular transport of cosmic rays, *Adv. Space Res.*, 49, 1643–1652, 2012.
- Qin, G., W. H. Matthaeus, and J. W. Bieber, Perpendicular Transport of Charged Particles in Composite Model Turbulence: Recovery of Diffusion, *Astrophys. J. Lett.*, 578, L117–L120, 2002a.
- Qin, G., W. H. Matthaeus, and J. W. Bieber, Subdiffusive transport of charged particles perpendicular to the large scale magnetic field, *Geophys. Res. Lett.*, 29(4), 10.1029/2001GL014035, 2002b.
- Qin, G., W. H. Matthaeus, and J. W. Bieber, Parallel Diffusion of Charged Particles in Strong Two-dimensional Turbulence, *Astrophys. J. Lett.*, 640, L103–L106, 2006.
- Richardson, I. G., H. V. Cane, and G. Wibberenz, A 22-year dependence in the size of near-ecliptic corotating cosmic ray depressions during five solar minima, *J. Geophys. Res.*, 104, 12,549–12,562, doi:10.1029/1999JA900130, 1999.
- Richardson, J. D., K. I. Paularena, A. J. Lazarus, and J. W. Belcher, Radial evolution of the solar wind from IMP 8 to Voyager 2, *Geophys. Res. Lett.*, 22, 325–328, 1995.
- Roberts, D. A., Evolution of the spectrum of solar wind velocity fluctuations from 0.3 to 5 AU, *J. Geophys. Res.*, 115, 12,101, 2010.
- Roberts, D. A., M. L. Goldstein, L. W. Klein, and W. H. Matthaeus, Origin and evolution of fluctuations in the solar wind - HELIOS observations and Helios-Voyager comparisons, *J. Geophys. Res.*, 92, 12,023–12,035, 1987a.
- Roberts, D. A., L. W. Klein, M. L. Goldstein, and W. H. Matthaeus, The nature and evolution of magnetohydrodynamic fluctuations in the solar wind - Voyager observations, *J. Geophys. Res.*, 92, 11,021–11,040, 1987b.
- Roberts, D. A., M. L. Goldstein, and L. W. Klein, The amplitudes of interplanetary fluctuations - Stream structure, heliocentric distance, and frequency dependence, *J. Geophys. Res.*, 95, 4203–4216, 1990.
- Roberts, D. A., M. L. Goldstein, W. H. Matthaeus, and S. Ghosh, Velocity shear generation of solar wind turbulence, *J. Geophys. Res.*, 97, 17,115, 1992.
- Roberts, D. A., J. Giacalone, J. R. Jokipii, M. L. Goldstein, and T. D. Zepp, Spectra of polar heliospheric magnetic fields and implications for field structure, *J. Geophys. Res.*, 112, 8103, doi:10.1029/2007JA012247, 2007.

- Ruffolo, D., Interplanetary transport of decay protons from solar flare neutrons, *Astrophys. J.*, 382, 688–698, 1991.
- Ruffolo, D., W. H. Matthaeus, and P. Chuychai, Separation of Magnetic Field Lines in Two-Component Turbulence, *Astrophys. J.*, 614, 420–434, 2004.
- Ruffolo, D., T. Pianpanit, W. H. Matthaeus, and P. Chuychai, Random Ballistic Interpretation of Nonlinear Guiding Center Theory, *Astrophys. J. Lett.*, 747, L34, 2012.
- Saur, J., and J. W. Bieber, Geometry of low-frequency solar wind magnetic turbulence: Evidence for radially aligned Alfvénic fluctuations, *J. Geophys. Res.*, 104, 9975–9988, doi: 10.1029/1998JA900077, 1999.
- Scherer, H., M. Bzowski, H. J. Fahr, and D. Ruciński, Improved analysis of interplanetary HST-HLy α spectra using time-dependent modelings, *Astron. Astrophys.*, 342, 601–609, 1999.
- Scherer, K., H. Fichtner, R. D. Strauss, S. E. S. Ferreira, M. S. Potgieter, and H.-J. Fahr, On Cosmic Ray Modulation beyond the Heliopause: Where is the Modulation Boundary?, *Astrophys. J.*, 735, 128, 2011.
- Schou, J., et al., Helioseismic studies of differential rotation in the solar envelope by the solar oscillations investigation using the Michelson Doppler Imager, *Astrophys. J.*, 505(1), 390–417, 1998.
- Schulze, B. M., A. K. Richter, and C. Wibberenz, Influence of finite injections and of interplanetary propagation on time-intensity and time-anisotropy profiles of solar cosmic rays, *Solar Physics*, 54, 207–228, 1977.
- Schwadron, N. A., An explanation for strongly underwound magnetic field in co-rotating rarefaction regions and its relationship to footpoint motion on the the sun, *Geophys. Res. Lett.*, 29, 1–8, 2002.
- Schwadron, N. A., and D. J. McComas, Heliospheric “FALTS”: Favored acceleration locations at the termination shock, *Geophys. Res. Lett.*, 30, 1–41, 2003.
- Schwadron, N. A., and D. J. McComas, Pickup ions from energetic neutral atoms, *Astrophys. J. Lett.*, 712, L157–L159, 2010.
- Shalchi, A., Extended nonlinear guiding center theory of perpendicular diffusion, *Astron. Astrophys.*, 453, L43–L46, 2006.
- Shalchi, A., Theoretical explanation of the large observed cosmic ray parallel mean free paths in the solar system, *Astron. Astrophys.*, 469, 839–842, doi:10.1051/0004-6361:20066743, 2007.
- Shalchi, A., *Nonlinear Cosmic Ray Diffusion Theories*, Springer, 2009.
- Shalchi, A., A Unified Particle Diffusion Theory for Cross-field Scattering: Subdiffusion, Recovery of Diffusion, and Diffusion in Three-dimensional Turbulence, *Astrophys. J. Lett.*, 720, L127–L130, 2010a.

- Shalchi, A., and A. Dosch, Nonlinear Guiding Center Theory of Perpendicular Diffusion: Derivation from the Newton-Lorentz Equation, *Astrophys. J.*, 685, 971–975, 2008.
- Shalchi, A., J. W. Bieber, and W. H. Matthaeus, Analytic forms of the perpendicular diffusion coefficient in magnetostatic turbulence, *Astrophys. J.*, 604, 675–686, doi:10.1086/382128, 2004a.
- Shalchi, A., J. W. Bieber, and W. H. Matthaeus, Analytic forms of the perpendicular diffusion coefficient in magnetostatic turbulence, *Astrophys. J.*, 604(2), 675–686, 2004a.
- Shalchi, A., J. W. Bieber, W. H. Matthaeus, and G. Qin, Nonlinear parallel and perpendicular diffusion of charged cosmic rays in weak turbulence, *Astrophys. J.*, 616, 617–629, 2004b.
- Shalchi, A., J. W. Bieber, and W. H. Matthaeus, Nonlinear guiding center theory of perpendicular diffusion in dynamical turbulence, *Astrophys. J.*, 615, 805–812, doi:10.1086/424687, 2004c.
- Shalchi, A., J. W. Bieber, W. H. Matthaeus, and R. Schlickeiser, Parallel and Perpendicular Transport of Heliospheric Cosmic Rays in an Improved Dynamical Turbulence Model, *Astrophys. J.*, 642, 230–243, 2006.
- Shalchi, A., J. A. le Roux, G. M. Webb, and G. P. Zank, Nonlinear field line random walk for non-Gaussian statistics, *Journal of Physics A Mathematical General*, 42, H5501, 2009.
- Shalchi, A., G. Li, and G. P. Zank, Analytic forms of the perpendicular cosmic ray diffusion coefficient for an arbitrary turbulence spectrum and applications on transport of Galactic protons and acceleration at interplanetary shocks, *Astrophys. Space Sci.*, 325, 99–111, 2010b.
- Shebalin, J. V., W. H. Matthaeus, and D. Montgomery, Anisotropy in mhd turbulence due to a mean magnetic field, *Journal of Plasma Physics*, 29, 525–547, 1983.
- Shikaze, Y., et al., Measurements of 0.2–20 GeV/n cosmic-ray proton and helium spectra from 1997 through 2002 with the BESS spectrometer, *Astroparticle Physics*, 28, 154–167, 2007.
- Simpson, J. A., J. J. Connell, C. Lopate, R. B. McKibben, and M. Zhang, The latitude gradients of galactic cosmic ray and anomalous helium fluxes measured on Ulysses from the sun's south polar region to the equator, *Geophys. Res. Lett.*, 22, 3337–3340, 1995b.
- Simpson, J. A., M. Zhang, and S. Bame, A solar polar north-south asymmetry for cosmic-ray propagation in the heliosphere: The ULYSSES pole-to-pole rapid transit, *Astrophys. J. Lett.*, 465, L69–L72, 1996.
- Simpson, J. A., et al., Cosmic Ray and Solar Particle Investigations Over the South Polar Regions of the Sun, *Science*, 268, 1019–1023, 1995.
- Simpson, J. A., et al., Cosmic ray and solar particle investigations over the south polar regions of the sun, *Science*, 268, 1019–1029, 1995a.

- Smith, C. W., The Geometry of Turbulent Magnetic Fluctuations at High Heliographic Latitudes, in *Solar Wind Ten*, 2003.
- Smith, C. W., and J. W. Bieber, Solar cycle variation of the interplanetary magnetic field spiral, *Astrophys. J.*, 370(1), 435–441, 1991.
- Smith, C. W., J. W. Bieber, and W. H. Matthaeus, Cosmic-ray pitch angle scattering in isotropic turbulence. II - Sensitive dependence on the dissipation range spectrum, *Astrophys. J.*, 363, 283–291, 1990.
- Smith, C. W., K. Hamilton, B. J. Vasquez, and R. J. Leamon, Dependence of the dissipation range spectrum of interplanetary magnetic fluctuations on the rate of energy cascade, *Astrophys. J. Lett.*, 645, L85–L88, 2006.
- Smith, C. W., P. A. Isenberg, W. H. Matthaeus, and J. D. Richardson, Turbulent Heating of the Solar Wind by Newborn Interstellar Pickup Protons, *Astrophys. J.*, 638, 508–517, 2006b.
- Smith, C. W., B. J. Vasquez, and J. V. Hollweg, Observational Constraints on the Role of Cyclotron Damping and Kinetic Alfvén Waves in the Solar Wind, *Astrophys. J.*, 745, 8, 2012.
- Smith, E. J., and A. Balogh, Decrease in heliospheric magnetic flux in this solar minimum: Recent Ulysses magnetic field observations, *Geophys. Res. Lett.*, 35, 22,103, 2008.
- Smith, E. J., A. Balogh, M. Neugebauer, and D. McComas, Ulysses observations of Alfvén waves in the southern and northern solar hemispheres, *Geophys. Res. Lett.*, 22, 3381–3384, 1995.
- Smith, W. S., W. H. Matthaeus, G. P. Zank, N. F. Ness, S. Oughton, and J. D. Richardson, Heating of the low-latitude solar wind by dissipation of turbulent magnetic fluctuations, *J. Geophys. Res.*, 106(A5), 8253–8272, 2001.
- Snodgrass, H. B., Magnetic rotation of the solar photosphere, *Astrophys. J.*, 270(1), 288–299, 1983.
- Stawicki, O., Quasi-linear Drift of Cosmic Rays in Weak Turbulent Electromagnetic Fields, *Astrophys. J.*, 624, 178–188, doi:10.1086/428748, 2005.
- Stawicki, O., S. P. Gary, and H. Li, Solar wind magnetic fluctuation spectra: Dispersion versus damping, *J. Geophys. Res.*, 106, 8273–8282, 2001.
- Sternal, O., N. E. Engelbrecht, R. A. Burger, S. E. S. Ferreira, H. Fichtner, B. Heber, A. Kopp, M. S. Potgieter, and K. Scherer, Possible Evidence for a Fisk-type Heliospheric Magnetic Field. I. Analyzing Ulysses/KET Electron Observations, *Astrophys. J.*, 741, 23, 2011.
- Stone, E., Voyager 2 in the Vicinity of the Termination Shock with Voyager 1 Well Beyond, *AGU Fall Meeting Abstracts*, pp. A1+, 2007.

- Stone, E. C., A. C. Cummings, F. B. McDonald, B. C. Heikkila, N. Lal, and W. R. Webber, Voyager 1 explores the termination shock region and the heliosheath beyond, *Science*, 309, 2017–2020, 2005.
- Strauss, R. D., M. S. Potgieter, I. Büsching, and A. Kopp, Modeling the Modulation of Galactic and Jovian Electrons by Stochastic Processes, *Astrophys. J.*, 735, 83, 2011.
- Tautz, R. C., and A. Shalchi, Numerical Test of Improved Nonlinear Guiding Center Theories, *Astrophys. J.*, 735, 92, 2011.
- Tautz, R. C., and A. Shalchi, Drift Coefficients of Charged Particles in Turbulent Magnetic Fields, *Astrophys. J.*, 744, 125, 2012.
- Tautz, R. C., A. Shalchi, and R. Schlickeiser, Solving the 90° Scattering Problem in Isotropic Turbulence, *Astrophys. J. Lett.*, 685, L165–L168, 2008.
- Taylor, G. I., The Spectrum of Turbulence, *Proc. R. Soc. Lond. Ser. A*, 164, 476–490, 1938.
- Tennekes, H., and J. Lumley, *A first course in Turbulence*, The MIT Press, 1972.
- Teufel, A., and R. Schlickeiser, Analytic calculation of the parallel mean free path of heliospheric cosmic rays. I. Dynamical magnetic slab turbulence and random sweeping slab turbulence, *Astron. Astrophys.*, 393, 703–715, doi:10.1051/0004-6361:20021046, 2002.
- Teufel, A., and R. Schlickeiser, Analytic calculation of the parallel mean free path of heliospheric cosmic rays. II. Dynamical magnetic slab turbulence and random sweeping slab turbulence with finite wave power at small wavenumbers, *Astron. Astrophys.*, 397, 15–25, 2003.
- Thomas, B. T., B. E. Goldstein, and E. J. Smith, The effect of the heliospheric current sheet on cosmic ray intensities at solar maximum - Two alternative hypotheses, *J. Geophys. Res.*, 91, 2889–2895, 1986.
- Tu, C.-Y., and E. Marsch, A model of solar wind fluctuations with two components - Alfvén waves and convective structures, *J. Geophys. Res.*, 98, 1257–1276, 1993.
- Tu, C.-Y., and E. Marsch, MHD structures, waves and turbulence in the solar wind: Observations and theories, *Space Sci. Rev.*, 73, 1–210, 1995.
- Turner, A. J., G. Gogoberidze, S. C. Chapman, B. Hnat, and W.-C. Müller, Nonaxisymmetric Anisotropy of Solar Wind Turbulence, *Phys. Rev. Lett.*, 107, 095,002, 2011.
- Usmanov, A. V., W. H. Matthaeus, B. Breech, and M. L. Goldstein, An MHD Solar Wind Model with Turbulence Transport, in *Numerical Modeling of Space Plasma Flows: ASTRONUM-2008*, *Astronomical Society of the Pacific Conference Series*, vol. 406, edited by N. V. Pogorelov, E. Audit, P. Colella, and G. P. Zank, p. 160, 2009.
- Usmanov, A. V., M. L. Goldstein, and W. H. Matthaeus, Three-dimensional Magnetohydrodynamic Modeling of the Solar Wind Including Pickup Protons and Turbulence Transport, *Astrophys. J.*, 754, 40, 2012.

- Vasyliunas, V. M., and G. L. Siscoe, On the flux and energy spectrum of interstellar ions in the solar system, *J. Geophys. Res.*, *81*, 1247–1252, 1976.
- Wang, C. P., L. R. Lyons, T. Nagai, J. M. Weygand, and R. W. McEntire, Sources, transport, and distributions of plasma sheet ions and electrons and dependences on interplanetary parameters under northward interplanetary magnetic field, *Journal of Geophysical Research (Space Physics)*, *112*, 10,224–+, doi:10.1029/2007JA012522, 2007.
- Wanner, W., and G. Wibberenz, Variations of Magnetic Field Fluctuation Spectra Inside 1 AU, in *International Cosmic Ray Conference, International Cosmic Ray Conference*, vol. 3, p. 217, 1991.
- Webb, G. M., and L. J. Gleeson, On the equation of transport for cosmic-ray particles in the interplanetary region, *Astrophys. Space Sci.*, *60*, 335–351, 1979.
- Webber, W. R., Voyager measurements of galactic cosmic rays and implications for modulation in the heliosheath and beyond, in *Physics of the Inner Heliosheath, American Institute of Physics Conference Series*, vol. 858, edited by J. Heerikhuisen, V. Florinski, G. P. Zank, and N. V. Pogorelov, pp. 135–140, 2006.
- Webber, W. R., and J. A. Lockwood, Heliocentric radial intensity profiles of galactic cosmic rays measured by the IMP, Voyager, and Pioneer spacecraft in solar 11-year modulation cycles of opposite magnetic polarity, *J. Geophys. Res.*, *109*, A11,101, 2004.
- Webber, W. R., B. Heber, and J. A. Lockwood, Time variations of cosmic ray electrons and nuclei between 1978 and 2004: Evidence for charge-dependent modulation organized by changes in solar magnetic polarity and current sheet tilt, *J. Geophys. Res.*, *110*, 12,107, 2005.
- Weinhorst, B., A. Shalchi, and H. Fichtner, The Cosmic-Ray Diffusion Tensor in Nonaxisymmetric Turbulence, *Astrophys. J.*, *677*, 671–675, 2008.
- Weygand, J. M., W. H. Matthaeus, S. Dasso, M. G. Kivelson, L. M. Kistler, and C. Mouikis, Anisotropy of the Taylor scale and the correlation scale in plasma sheet and solar wind magnetic field fluctuations, *J. Geophys. Res.*, *114*, 7213, 2009.
- Weygand, J. M., W. H. Matthaeus, D. S., and M. Kivelson, Correlation and Taylor scale variability in the interplanetary magnetic field fluctuations as a function of solar wind speed, *J. Geophys. Res.*, *116*, 2011.
- Wicks, R. T., S. C. Chapman, and R. O. Dendy, Spatial Correlation of Solar Wind Fluctuations and Their Solar Cycle Dependence, *Astrophys. J.*, *690*, 734–742, 2009.
- Wicks, R. T., M. J. Owens, and T. S. Horbury, The variation of solar wind correlation lengths over three solar cycles, *Solar Physics*, *262*, 191–198, 2010.
- Wicks, R. T., T. S. Horbury, C. H. K. Chen, and A. A. Schekochihin, Anisotropy of Imbalanced Alfvénic Turbulence in Fast Solar Wind, *Phys. Rev. Lett.*, *106*, 045,001, 2011.

- Wicks, R. T., M. A. Forman, T. S. Horbury, and S. Oughton, Power anisotropy in the magnetic field power spectral tensor of solar wind turbulence, *Astrophys. J.*, 746, 103, 2012.
- Williams, L. L., and G. P. Zank, Effect of magnetic field geometry on the wave signature of the pickup of interstellar neutrals, *J. Geophys. Res.*, 99, 19,229, 1994.
- Williams, L. L., G. P. Zank, and W. H. Matthaeus, Dissipation of pickup-induced waves: A solar wind temperature increase in the outer heliosphere?, *J. Geophys. Res.*, 100, 17,059–17,068, 1995.
- Yokoi, N., and F. Hamba, An application of the turbulent magnetohydrodynamic residual-energy equation model to the solar wind, *Physics of Plasmas*, 14, 112,904, 2007.
- Zank, G. P., Interaction of the solar wind with the local interstellar medium: a theoretical perspective, *Space Sci. Rev.*, 89, 413–688, 1999.
- Zank, G. P., W. H. Matthaeus, and C. W. Smith, Evolution of turbulent magnetic fluctuation power with heliospheric distance, *J. Geophys. Res.*, 101(A8), 17,093–17,107, 1996.
- Zank, G. P., W. H. Matthaeus, J. W. Bieber, and H. Moraal, The radial and latitudinal dependence of the cosmic ray diffusion tensor in the heliosphere, *J. Geophys. Res.*, 103, 2085, 1998.
- Zank, G. P., A. Dosch, P. Hunana, V. Florinski, W. H. Matthaeus, and G. M. Webb, The Transport of Low-frequency Turbulence in Astrophysical Flows. I. Governing Equations, *Astrophys. J.*, 745, 35, 2012.
- Zhang, L., and K. S. Cheng, Cosmic-ray positrons from mature gamma-ray pulsars, *Astron. Astrophys.*, 368, 1063–1070, 2001.
- Zhang, M., A linear relationship between the latitude gradient and 26 day recurrent variation in the fluxes of galactic cosmic rays and anomalous nuclear components. I. Observations, *Astrophys. J.*, 488(2), 841–853, 1997.
- Zhang, M., A Path Integral Approach to the Theory of Heliospheric Cosmic-Ray Modulation, *Astrophys. J.*, 510, 715–725, 1999a.
- Zhang, M., A Markov Stochastic Process Theory of Cosmic-Ray Modulation, *Astrophys. J.*, 513, 409–420, doi:10.1086/306857, 1999b.
- Zhang, M., G. Qin, and H. Rassoul, Propagation of Solar Energetic Particles in Three-Dimensional Interplanetary Magnetic Fields, *Astrophys. J.*, 692, 109–132, 2009.
- Zhou, Y., and W. H. Matthaeus, Models of inertial range spectra of interplanetary magnetohydrodynamic turbulence, *J. Geophys. Res.*, 95, 14,881–14,892, 1990.
- Zhou, Y., W. H. Matthaeus, and P. Dmitruk, Colloquium: Magnetohydrodynamic turbulence and time scales in astrophysical and space plasmas, *Reviews of Modern Physics*, 76, 1015–1035, 2004.

-
- Zurbuchen, T. H., N. A. Schwadron, and L. A. Fisk, Direct observational evidence for a heliospheric magnetic field with large excursions in latitude, *J. Geophys. Res.*, 102(A11), 24,175–24,181, 1997.
- Zwickl, R. D., and W. R. Webber, Solar particle propagation from 1 to 5 AU, *Solar Physics*, 54, 457–504, 1977.
- Zwickl, R. D., and W. R. Webber, The interplanetary scattering mean free path from 1 to 3 X 1000 MV, *J. Geophys. Res.*, 83, 1157–1161, 1978.