

# Biographical Sketch for Robert S. Weigel

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## Professional Preparation

University of Texas at Austin, Ph.D. Physics, December 2000.

University of Illinois at Urbana–Champaign, M.S. Physics, 1997.

University of Wisconsin–Platteville, B.S. Mechanical Engineering, 1995.

## Appointments

**Research Scientist, Feb. 2003–Pres.** Laboratory of Atmospheric and Space Physics, Univ. of Colorado–Boulder.

**Postdoctoral Researcher, Jan. 2001– Jan. 2003**, National Academy of Sciences at NASA Goddard.

**Research Assistant, Sep. 1997–Dec. 2000**, University of Texas at Austin

**Research Assistant, Jan. 1996–May 1997**, University of Illinois at Urbana–Champaign.

**Undergraduate Research, Summer 1994**, Virginia Tech.

**Undergraduate Research, 1994–1995**, UW–Platteville.

## Publications

Weigel, R.S., D.N. Baker, D. Vassiliadis, and E.J. Rigler, Predictability of Geomagnetic Fluctuations Based on Solar Wind Conditions, *IEEE Transactions on Plasma Science*, 32, 4, 2004.

Weigel, R.S. and D.N. Baker, Probability Distribution Invariance of 1-Minute Auroral-Zone Geomagnetic Field Fluctuations, *Geophys. Res. Lett.*, doi:10.1029/2003GL018470, 2003.

Weigel, R.S., D. Vassiliadis, and A.J. Klimas, Precursor analysis and Prediction of Large–Amplitude Energetic Electron Events, *Space Weather*, doi:10.1029/2003SW000023, 2003.

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Weigel, R.S., D. Vassiliadis, and A.J. Klimas, Coupling of the Solar Wind to Temporal Fluctuations in Ground Magnetic Fields, *Geophys. Res. Lett.*, 29, 19, doi:10.1029/2002GL014740, 2002.

Weigel, R.S., W. Horton, T. Tajima, and T. Detman, Forecasting auroral electrojet activity from solar wind input with neural networks, *Geophys. Res. Lett.*, 26, 10, 1353–1356, 1999.

Weigel, R. and E. Atlee Jackson, Experimental implementation of migrations in multiple–attractor systems, *Int. J. of Bifurcations and Chaos*, 8, 1, 173–178, 1998.

Baker, D. N., Weigel, R. S., Rigler, E. J., McPherron, R. L., Vassiliadis, D., Arge, C. N., Siscoe, G. L., and Spence, H. E., Sun-to-magnetosphere modeling: CISM forecast model development using linked empirical methods, *J. Atmos. and Solar-Terrestrial Phys.*, 66, 15–16, 2004.

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Rigler, E. J., Baker, D. N., Weigel, R. S., Vassiliadis, D., Klimas, A. J., Adaptive linear prediction of radiation belt electrons using the Kalman filter, *Space Weather*, 2, 3, 2004.

Vassiliadis, D., Klimas, A. J., Weigel, R. S., Baker, D. N., Rigler, E. J., Kanekal, S. G., Nagai, T., Fung, S. F., Friedel, R. W. H., and Cayton, T. E, Structure of Earth's outer radiation belt inferred from long-term electron flux dynamics, *Geophys. Res. Lett.*, 30, 19, 2003.

Vassiliadis D, A.J. Klimas, R.S. Weigel, D.N. Baker, E.J. Rigler, S.G. Kanekal, T. Nagai, S.F. Fung, R.W.H. Friedel, T.E. Cayton, Structure of Earth's outer radiation belt inferred from long-term electron flux dynamics, *Geophys. Res. Lett.* 30, 19, 2015, 2003.

Vassiliadis, D., A.J. Klimas, S.G. Kanekal, D.N. Baker, and R.S. Weigel, Long-Term Solar-Cycle, and Seasonal Response of Magnetospheric Energetic Electrons to the Solar Wind Speed, *J. Geophys. Res.*, *107*, doi:10.1029/2001JA000506, 2002.

Horton, W., R.S. Weigel, D. Vassiliadis, and I. Doxas, Substorm Classification with the WINDMI Model, *Nonlinear Processes in Geophysics*, *10*, 4, 2003.

Vassiliadis, D., R.S. Weigel, A.J. Klimas, S.G. Kanekal, and R.A. Mewaldt, Modes of Energy Transfer Between the Solar Wind and the Inner Magnetosphere, *Phys. Plasmas*, *10*, 2, 463-473, 2003.

Horton W, C. Crabtree, I. Doxas, and R.S. Weigel, Geomagnetic transport in the solar wind driven nightside magnetosphere-ionosphere system, *Phys. Plasmas*, *9*, 9, 3712-3720, 2002.

Doxas, I. and Horton, W. and Weigel, R., Using particle simulations for parameter tuning of dynamical models of the magnetotail, *J. Atmos. Sol.-Terr. Phys.*, *64*, 633-638, 2002.

Baker, D. N., Weigel, R. S., Rigler, E. J., McPherron, R. L., Vassiliadis, D., Arge, C. N., Siscoe, G. L., and Spence, H. E., Sun-to-magnetosphere modeling: CISM forecast model development using linked empirical methods, *J. Atmos. and Solar-Terrestrial Phys.*, *66*, 15-16, 2004.

Breitling, F., R.S. Weigel, M. Downer, and T. Tajima, Laser pointing stability control by a Neural Network in the sub-microradian region, *Review of Scientific Instruments*, *72*, **2**, 1339-1342, 2001.

Horton, W., R.S. Weigel, and J.C. Sprott, Chaos and the limits of predictability of the solar-wind driven magnetosphere-ionosphere system, *Phys. Plasmas* *8*, 1070 2001.

Horton, W., J.P. Smith, R. Weigel, C. Crabtree, I. Doxas, B. Goode, and J. Cary, The solar-wind driven magnetosphere-ionosphere as a complex dynamical system, *Phys. Plasmas*, **6**, *11*, 1-7, 1999.

Horton, W., H. Vernon Wong, and R. Weigel, Interchange Trigger for Substorms in a Nonlinear Dynamics Model, *Physics of Space Plasmas*, **15**, 169-173, 1998.

## **Synergistic Activities**

Dr. Weigel is engaged in several synergistic activities including acting as a Knowledge Transfer Liaison from the Center for Integrated Space Weather Modeling to the Space Environment Center and the Air Force Weather Agency. He has given lectures to graduate students about space weather at the University of Colorado at LASP and the Center for Integrated Space Weather Modeling summer school.

## **Collaborators and Other Affiliations**

McPherron, R.L., F. Breitling, C. Crabtree, M. Downer, I. Doxas, W. Horton, S. Kanekal, R.A. Mewaldt, A. Klimas, C. Sprott, V. Uritsky, D. Vassiliadis, H.V. Wong, E.J. Rigler, M. Gehymeyr.

## **Graduate and Postdoctoral Adviser**

Graduate adviser: W. Horton, Physics Department, University of Texas at Austin.

Postdoctoral Adviser: A.J. Klimas, NASA/Goddard Space Flight Center.