

Qihou Zhou

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Research and Teaching Interests

- Radar/satellite remote sensing techniques and their applications; Space Sciences
- Digital signal and image processing;
- Electronics, circuits, computer aided experimentations, and electromagnetics.

Education

Ph.D., Aug., 1991, Electrical Engineering, Pennsylvania State University.

M.S. May, 1991, Electrical Engineering, Pennsylvania State University.

M.A., Aug., 1991, Mathematics, Pennsylvania State University.

B. S., July, 1982, Applied Optics, Harbin Institute of Technology, China.

Employment History

*Jul. 2006 – Present: Associate Professor, Electrical and Computer Engineering
Department, Miami University, Ohio*

*Aug. 2004 – Jun. 2006: Assistant Professor, Electrical and Computer Engineering
Department, Miami University, Ohio*

*Aug. 2002 – Jun. 2004: Assistant Professor, Manufacturing Engineering
Department, Miami University, Ohio*

Sept., 1997 - Aug., 2002: Senior Research Associate, Cornell University.

Arecibo Observatory, National Astronomy and Ionosphere Center

Sept., 1991- Sept., 1997: Research Associate, Cornell University.

Professional Activities/Services

- Member of IEEE;
- Life Member of the American Geophysical Union;
- Member of International Union of Radio Science, Commission G & H;
- Have served as a reviewer/referee, or review panel member for the following agencies and journals:
 - National Science Foundation;
 - National Aeronautics and Space Administration;

- Advances in Space Research; Annals Geophysicae; Geophysical Research Letters; IEEE Transactions on Geoscience and Remote Sensing; Journal of Atmosphere and Solar-Terrestrial Physics; Journal of Atmosphere Chemistry and Physics; Journal of Geophysical Research -Atmosphere; Journal of Geophysical Research - Space Physics; Radio Science;
- Served as a chair person or convener for various URSI and CEDAR workshops.

Selected Grants

- Zhou, Q., Collaborative Research: CEDAR: Daytime Potassium Doppler Lidar at Arecibo, NSF proposal, May, 2005.
- Morton, Y. T., Q. Zhou, "Integrated Reconfigurable Aperture, Digital Beam Forming, and Software GPS Receiver for UAV Navigation," AFOSR Mathematical & Space Science Program, July 2004.
- Zhou, Q., Y. T. J. Morton, "Dual-Beam incoherent scatter radar study of the mesosphere at Arecibo," National Science Foundation, May, 2003.
- Morton, Y. T., Q. Zhou, "Integrated Reconfigurable Aperture, Digital Beam Forming, and Software GPS Receiver for UAV Navigation," Miami University OARS Matching Fund to AFOSR grant. Dec. 2004.

Refereed Journal Publications

A. Remote sensing, signal processing and space/ionospheric physics

2006-2007

- Zhou, Q., Y. T. Morton, A case study of mesospheric gravity wave momentum flux and dynamical instability using the Arecibo dual beam incoherent scatter radar, *Geophys. Res. Lett.*, 33, L10802, doi:10.1029/2005GL025608, 2006.

2004-2005

- Morton, Y. T., M. P. French, Q. Zhou, J. B. Y. Tsui, D. M. Lin, M. M. Miller, D. Jennings, "A Software Approach to Access Ultra-Wide Band Interference on GPS Receivers," Invited paper, *IEEE Aerospace & Electronics Systems Magazine*, V.20, No.1, P28-33, January 2005.
- Zhou, Q. H., and Y. T. Morton, Incoherent scatter radar study of photochemistry in the E-region, *Geophys. Res. Lett.*, *Geophys. Res. Lett.*, 32, L01103, doi:10.1029/2004GL021275, 2005.
- Zhou, Q. H., J. Friedman, S. Raizada, C. Tepley, and Y. T. Morton, Morphology of nighttime ion, potassium and sodium layers in the meteor zone above Arecibo, *J. Atmos. Solar-Terr. Phys.*, 67, 1245-1257, 2005.
- Goncharenko L., J. E. Salah, A. Van Eyken, V. Howells, J. P. Thayer, V. I. Taran, B. Shpynev, Q. Zhou, J. Chau, Observations of the April 2002 Geomagnetic Storm by the Global Network of Incoherent Scatter Radars, *Annal. Geophys.*, v. 23, 163-181, 2005.
- Martin, J., Y. T. Morton, and Q. H. Zhou, Neural network development for the forecasting of upper atmosphere parameters distributions, 36 (12)2480-2485, *Sp. Iss.* 2005, 2005.
- Hysell, D., M. Larsen, and Q. Zhou, Common volume coherent and incoherent scatter radar observations of midlatitude sporadic E layer echoes and QP echoes, *Annales Geophysicae*, 22, 3277-3290, 2004.
- Urbina, J., E. Kudeki, S. Franke, Q. Zhou, Analysis of a mid-latitude E-region LQP event observed during the Coqui 2 campaign, *Geophys. Res. Lett.*, 31, L14805, 2004, doi:10.1029/2004GL020031.

- Raizada, S., C. A. Tepley, D. Janches, J. S. Friedman, and Q. H. Zhou, Lidar observations of Ca and K metallic layers from Arecibo and comparison with micrometeor sporadic activity, *J. Atmos. Solar-Terr. Phys.*, 66, 595-606, 2004.
- Zhang, S. P., J. P. Theayer, R. G. Roble, J. E. Salah, G. G. Shepherd, L. P. Goncharenko, Q. H. Zhou, Latitudinal variation of neutral wind structure in the lower thermosphere for the March equinox condition, *J. Atmos. Solar Terr. Phys.*, 66, 105-117, 2004.
- Zhou, Q. H., Y. T. Morton, J. D. Mathews, D. Janches, Aspect Sensitivity of VHF echoes from field-aligned irregularities in meteor trails and thin ionization layer, *Atmospheric Chemistry and Physics, Atmospheric Chemistry and Physics*, 4, 685-692, 2004.

2002-03

- Friedman, J., C. A. Tepley, S. Raizada, Q. H. Zhou, J. Hedin. and R. Delgado, Potassium Doppler-resonance lidar for the study of the mesosphere and lower thermosphere at the Arecibo Observatory, *J. Atom. Solar-Terr. Phys.*, 65 (16-18): 1411-1424 NOV-DEC , 2003.
- Janches, D., M. C. Nolan, D. D. Meisel, J. D. Mathews, Q. H. Zhou, and D. E. Moser, On the geocentric micrometeor velocity distribution, *J. Geophys. Res.*, Vol. 108, No. A6 10.1029/2002JA009789, 2003.
- Tepley, C.A., Raizada, S., Zhou, Q.H., and Friedman, J., Observations of Ca +, k, AND Electron Density Using Lidar and Incoherent Scatter Radar at Arecibo, *Geophys.Res. Lett.* 30, 1009, 2003.
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- Zhou, Q. H., Incoherent scatter spectral width and its applications, *Radio Sci.*, 37, 19-1, 2002.

2000-01

- Friedman, J. S., S. A. González, C. A. Tepley, Q. H. Zhou, M. P. Sulzer, S. C. Collins, and B. W. Grime, Simultaneous Atomic and Ion Layer Enhancements Observed in the Mesopause Region over Arecibo during the Coqui II Sounding Rocket Campaign, *Geophysical Research Letters*, 27, 449, 2000.
- Isham, B., C. A. Tepley, M. P. Sulzer, Q. H. Zhou, and M. C. Kelley, J. Friedman, and S. Gonzalez, Ionospheric observations at the Arecibo Observatory: Examples obtained using new capabilities, *J. Geophys. Res.*, 105, 18,609, 2000.
- Janches, D., J. D. Mathews, D. D. Meisel, V. S. Getman, and Q. H. Zhou, Doppler studies of near-antapex UHF radar meteors, *ICARUS*, 143, 347-353, 2000a.
- Janches, D., J. D. Mathews, D. D. Meisel, and Q. H. Zhou, Micrometeor Observation using the Arecibo 430 MHz Radar: I. Determination of the Ballistic Parameter from measured Doppler Velocity and Deceleration Results, *Icarus*, 145, 53-63, 2000b.
- Mathews, J. D., D. W. Machuga, and Q. H. Zhou, Evidence for electrodynamic linkages between spread-F, ion rain, the intermediate layer and sporadic E: Results from recent observations and simulations, *J. Atmos. Solar-Terr. Phys.*, 63, 1529, 2001a.
- Mathews, J. D., D. Janches, D. D. Meisel, Q. H. Zhou, The micrometeoroid mass flux into the upper atmosphere: Arecibo results and a comparison with prior estimates, *Geophys. Res. Lett.*, 28, 1929, 2001b.
- Mathews, J. D., S. Gonzalez, M. P. Sulzer, and Q. H. Zhou, J. Urbina, E. Kudeki, and S. Franke, Kilometer-scale layered structures inside spread-F, *Geophys. Res. Lett.*, 28, 4167, 2001c.
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- Urbina, J., Kudeki, E., Franke, S.J., González, S., Q. H. Zhou, and Collins, S.C., 50 MHz Radar Observations of Mid-Latitude E-Region Irregularities at Camp Santiago, Puerto Rico, *Geophys. Res. Lett.*, 27, 2853, 2000.
- Zhou, Q. H., Incoherent scatter radar measurement of vertical wind in the mesosphere, *Geophys. Res. Lett.*, 27, 1803, 2000.

- Zhou, Q. H., H. Monroy, D. C. Fritts, H. M. Ierke, B. Isham, J. R. Isler, and S. E. Palo, Radar observations of longitudinal variability of tidal/planetary waves and mean winds in the tropical mesosphere, *J. Geophys. Res.*, 105, 2151, 2000.
- Zhou, Q. H., and J. D. Mathews, Comments on "Modelling the peak of the ionospheric E-layer" by J.E. Titheridge, *J. Atmos. Solar-Terr. Phys.*, 63, 627, 2001.
- Zhou, Q. H., J. D. Mathews and ., T. Nakamura,, Implications of meteor observations by the MU radar, *Geophys. Res. Lett.*, 1399-1402, 2001.

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- Zhou, Q. H., Q. N. Zhou and J. D. Mathews, Arithmetic average, geometric average and ranking - Application to incoherent scatter radar data processing, *Radio Sci.*, 34, 1227-1237, 1999b.

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- Scali, J. L., B. W. Reinisch, M. C. Kelley, C. A. Miller, W. E. Swartz, Q. Zhou, and S. Radicella, Incoherent scatter radar and digisonde observations at tropical latitudes, including conjugate point studies, submitted to *J. Geophys. Res.*, 102A, 7357-7367, 1997a.
- Scali, J. L., B. W. Reinisch, P. G. Richards, Q. Zhou, M. P. Sulzer and, W. E. Swartz, Comparison of Incoherent Scatter Radar and Digisonde Measurements with FLIP Modeled Results at Middle and Low Latitudes, *J. Geophys. Res.* 102A, 7345-7355, 1997b.
- Zhou, Q., and M. C. Kelley, Meteor observation by the Arecibo 430 MHz ISR II. results from time-resolved observations, *J. Atmo. Solar-Terr. Phys.*, 59, 739-752, 1997.
- Zhou, Q., and M. P. Sulzer, Incoherent scatter radar observation of the F-region ionosphere at Arecibo during January 1993, *J. Atmo. and Solar-Terr. Phys.*, 59, 2213-2229, 1997.
- Zhou, Q., M. P. Sulzer, and C. A. Tepley, An analysis of tidal and planetary waves in the neutral winds and temperature observed at the E-region, *J. Geophys. Res.*, 102, 11,491-11,505, 1997a.

Zhou, Q., M. P. Sulzer, C. A. Tepley, C. G. Fesen, R. G. Roble and M. C. Kelley, Neutral winds and temperature at the lower thermosphere and mesosphere during January 1993 - Observations and comparison with TIME-GCM, *J. Geophys. Res.*, 102, 11,507-11,519, 1997b.

1993-95

- Kane, T. J., C. S. Gardner, Q. Zhou, J. D. Mathews and C. A. Tepley, Lidar, radar, and airglow observations of a large sporadic Na/Sporadic E layer event at Arecibo during AIDA-89, *J. Atmo. Terr. Phys.* vol. 55, p. 499, 1993.
- Mathews, J. D., Y. T. Morton, and Q. Zhou, Observations of ion layer motions during AIDA campaign, *J. Atmo. Terr. Phys.*, 55, 447-457. 1993a.
- Mathews, J. D., Q. Zhou, C. R. Philbrick, Y. T. Morton and C. S. Gardner, Observations of ion and sodium coupled processes during AIDA, *J. Atmo. Terr. Phys.*, 55, 487-498, 1993b.
- Mathews, J. D., T. J. Kane, C. S. Gardner, and Q. Zhou, Ion and sodium sporadic layer results from the AIDA campaign, *Solar-Terrestrial Energy Program, COSPAR Colloquia Series, Vol. 5* , 363-368, 1994.
- Morton, Y. T., J. D. Mathews, and Q. Zhou, Further evidence for a six-hour tide above Arecibo, *J. Atmo. Terr. Phys.*, vol. 55, p. 459, 1993.
- Zhou Q., J. D. Mathews, and C. A. Tepley, A proposed temperature dependent mechanism for the formation of sporadic sodium layers, *J. Atmo. Terr. Phys.* vol. 55, p. 513, 1993.
- Zhou, Q., and J. D. Mathews, An ISR interference detection and correction technique based on the spectral information, *Radio Sci.*, 29, p.1173, 1994.
- Zhou, Q., A simplified approach to internal gravity wave damping by viscous dissipation, *J. Atmo. Terr. Phys.*, vol. 57, p. 1009, 1995.
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- Zhou, Q., C. A. Tepley, and M. P. Sulzer, Meteor observation by the Arecibo 430 MHz ISR I. results from time-integrated observations, *J. Atmo. Terr. Phys.*, vol. 57, p. 421, 1995.

B. Applied optics

- Yu, F. T. S., and Q. Zhou, A multichannel optical correlator, *Optics Comm.*, Vol. 64, No. 2, p. 111, 1987.
- Yu, F. T. S., Q. Zhou, and C. Zhang, An electronically addressed optical correlator using LCTV, *Applied Optics*, Vol. 27, 1988.
- Zhou, Q., A high capacity scanning correlation system and the analysis of correlation plane displacement, *Applied Optics*, vol. 26, No. 24, p.5350 1987.
- Zhou, Q., and X. Lu, Diffraction by 3-D oriented grating and its use in scanning correlation detection, *Applied Optics*, vol. 26, No. 24, p. 4803, 1987.

C. Electromagnetic theory and artificial intelligence

- Zhou, Q., Proof of Biot-Savart's law for discontinuous currents, *Eur. J. of Phys.*, Vol. 8, p. 128, 1987.
- Zhou, Q., A distributive model for playing game link-5 and its computer implementation, *IEEE Tran. Man, System and Cybernetics*, 23, p. 897, 1993.

Peer-reviewed conference proceedings

- Morton, Y. T. J., Tsui, J. B. Y., Lin, D. M., Miller, M. M., Schamus, J., Zhou, Q., and French, M. P., "Assessment and handling of CA code self-interference during weak GPS signal acquisition", *Proceedings of the 2003 Institute of Navigation Conference*, Portland, OR, Sept. 2003.
- Morton, Y. T., Q. Zhou, M. P. French, J. B. Y. Tsui, D. M. Lin, M. M. Miller, "A Software Approach to Access Ultra-Wide Band Interference on GPS Receivers", *Proc. of the 2004 IEEE PLANS Conference*, P551-557, Monterey, CA, April, 2004..
- Mantz, C., Q. Zhou, and Y. T. Morton, "Application of a neutral network model to the GPS ionosphere error correction," *Proc. of the 2004 IEEE PLANS Conf.*, P538-542, Monterey, CA, 2004.

- Martin, J. D.; Morton, Y. T.; Zhou, Q., "Neural network development for the forecasting of upper atmosphere parameters distributions", Proceedings of the 2002 COSPAR Conference, Houston, TX, Oct., 2002
- Mathews, J. D., D. D. Meisel, D. Janches, V. S. Getman, and Q. H. Zhou, Possible origins of low inclination antapex micrometeors observed using the Arecibo UHF radar, Meteoroids 1998, Proc. Astron. Inst., Slovak. Acad. Sci, Bratislava, 79-82, 1998a.
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- Q. Zhou, Unusual UHF meteor echo characteristics observed at Arecibo, 7th MST radar workshop, Hilton Head Island, SC, 1995.
- J. D. Mathews, T. J. Kane, C. S. Gardner and Q. Zhou, Ion and sodium sporadic layer results from the 1989 AIDA campaign, Proceedings of the 1992 STEP symposium/ 5th COSPAR Colloquia Series, 5, 363-368, 1994.
- Yu, F. T. S., M. F. Cao, and Q. Zhou, Automatic real-time optical pattern recognition system, SPIE proceeding, vol. 638, p.16, 1986.

Conference/proceeding Publications

Author or co-author of over 120 conference abstracts and presentations.