

Curriculum Vitae

Zhaohua Wu

University address: Earth, Ocean, and Atmospheric Science
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Florida State University
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EDUCATION:

- 1998 Ph.D., University of Washington, Seattle, WA. Major: Atmospheric Sciences. Supervisor: Edward S. Sarachik and David S. Battisti.
- 1991 1988-1991, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, China. Major: Graduate Study. Supervisor: Congbin Fu.
- 1988 B.S., Department of Atmospheric Sciences, Nanjing University, Nanjing, China. Major: Atmospheric Sciences.

EMPLOYMENT:

- 2014– Associate Professor, Earth, Ocean & Atmospheric Science, Florida State University, Tallahassee, FL.
- 2009–2014 Assistant Professor, Earth, Ocean & Atmospheric Science, Florida State University, Tallahassee, FL.
- 2002–2008 Research Scientist, Center for Ocean-Land-Atmosphere Studies, Calverton, MD.
- 2001–2005 Lecturer, Department of Computer Sciences, Southeastern University, Washington, DC.
- 2000–2001 Postdoctoral Research Scientist, Center for Ocean-Land-Atmosphere Studies, Calverton, MD. Advisors: Edwin K. Schneider and Benjamin P. Kirtman.
- 1999 Research Associate, Joint Institute for the Study of the Atmosphere and Ocean. Advisor: Edward S. Sarachik.

1991–1998 Graduate Research Assistant, Department of Atmospheric Sciences, University of Washington, Seattle, WA.

1988–1991 Graduate Research Assistant, Institute of Atmospheric Physics, Chinese Academy of Sciences, P. R. China.

HONORS, AWARDS, & PRIZES

2011 Hilbert-Huang Transform Outstanding Contribution Award
2009 First Year Assistant Professor Award, Florida State University
2007 NASA Technology Awards (category: NASA Patent Application Award)
2006 NASA Technology Awards (category: NASA Patent Application Award)

EDITORIAL SERVICES

2012- Editor, *Journal of the Atmospheric Sciences*
2007- Editor (founding editor), *Advances in Adaptive Data Analysis*
2011-2012 Associate editor, *Journal of the Atmospheric Sciences*

INVITED KEYNOTE & PLENARY PRESENTATIONS

2013, Sep International Top-Level Forum on Engineering Science and Technology Development Strategy: Role of the Oceans in Multi-decadal Climate Variability, Chinese Academy of Engineering, Beijing, China.
2013, Jan Workshop on Adaptive Data Analysis and Sparsity, Institute for Pure and Applied Mathematics, University of California at Los Angeles, University of California at Los Angeles.
2012, Sep WCRP/CLIVAR Workshop on Decadal and Multi-decadal Variability in Pacific and Indian Ocean, WCRP/CLIVAR, Qingdao, China.
2011, Sep Hot Topics Workshop: Instantaneous Frequencies and Trends for Nonstationary Nonlinear Data, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, MN.
2011, Jun The Third International Conference on the Advances of Hilbert-Huang Transform and Its Applications, The first Institute of Oceanography, China Oceanic Administration, Qingdao, China.

- 2009, Dec The International Conference on Sparse Representation of Multiscale Data and Images: Theory and Applications, Institute of Advanced Studies, Nanyang Technological University, Singapore, Singapore.
- 2008, Dec The Second International Conference on the Advances of Hilbert-Huang Transform and Its Applications, Sun Yat-Sen University, China, Guangzhou, China.
- 2006, Jun The International Conference on Applied Harmonic Analysis: Approximation and Computation, Chinese Academy of Sciences, Beijing, China.
- 2006, Mar The First International Conference on the Advances of Hilbert-Huang Transform and Its Applications, National Central University, Chung-Li, Taiwan.

TEACHING

Courses Taught

- 2011- *Atmospheric Dynamics I* (MET4301), Florida State University.
- 2011- *Advanced Dynamic Meteorology I* (MET5311), Florida State University.
- 2010- *Meteorological Computations* (MET3220), Florida State University.
- 2009-2010 *Advanced Topics in Climatology* (MET6155), Florida State University.
- 2012, May *Atmospheric Dynamics*, The First Institute of Oceanography, State Oceanic Administration of China, Qingdao, China, May 2012.
- 2011, May *Physical Analysis of Data*, The First Institute of Oceanography, State Oceanic Administration of China, Qingdao, China, May 2011.
- 2001-2005 *Problem Solving Using Higher Level Languages* (COSC 502), Southeastern University, Washington, DC
- 2001 *Calculus II* (MATH 302), Southeastern University, Washington, DC
- 2013 Short Course: *Training Course on Air-Sea Interactions and Modeling*, UNESCO/IOC-ODC Center, Qingdao, China, Aug. 2013.
- 2010 Short Course: *The Hilbert-Huang Transform*, The First Institute of Oceanography, State Oceanic Administration of China, Qingdao, China, Jun. 2010.

- 2008 *Short Course: Physical Time-Frequency Analysis*, Nanjing University, Nanjing, China.
- 2008 *Short Course: The Hilbert-Huang Transform*, Sun Yat-Sen (Zhongshan) University, Guangzhou China.
- 2008 *Short Course: Physical Time-Frequency Analysis*, Center for Ocean-Land-Atmosphere Studies, Calverton, MD.

Past and Current Graduate Students

Zhixiu Dai (FSU); Jie Sun (FSU); Jiixin Feng (FSU); Sarah Strazzo (FSU); Fei Ji (Lanzhou University, China); Cheng Qian (Chinese Academy of Sciences).

RESEARCH

Peer Reviewed Journal Papers (corresponding author “*”; student “†”)

1. **Wu***, **Z.**, Huang, N. E., & Wallace, J. M., (2014, in press): Adaptive and local analysis of climate data. *Chinese Engineering Sciences*.
2. Feng[†], J., **Wu***, **Z.**, & Liu, G., (2014, in press). Fast multi-dimensional ensemble empirical mode decomposition using data compression technique. *Journal of Climate*.
3. Feng[†], J., **Wu***, **Z.**, & Zou, X., (2014, in press). Sea surface temperature anomalies off Baja California: a precursor of central Pacific ENSO. *Journal of the Atmospheric Sciences*.
4. Ji[†], F., **Wu***, **Z.**, Huang, J., & Chassignet, E., (2014, in press). Evolution the global land surface air temperature trend. *Nature Climate Change*. (Ji and Wu are co-first authors.)
5. Mandic, D., Rehman, N., **Wu, Z.**, & Huang, N. (2013). Empirical Mode Decomposition-Based Time-Frequency Analysis of Multivariate Signals: The Power of Adaptive Data Analysis, *IEEE Signal Processing Magazine*. **30 (6)**, 74-86. doi: 10.1109/MSP.2013.2267931.
6. Chen, X., Wang, M., Zhang, Y., Feng, Y., **Wu, Z.**, & Huang, N. E. (2013). Detecting Signal from Data with Red Noise: Theory and Applications. *Journal of the Atmospheric Sciences*, **70**, 1489–1504. doi:10.1175/JAS-D-12-0213.1.
7. Chen, X., Zhang, Y., Zhang, M., Feng, Y., **Wu, Z.**, Qiao, F., & Huang, N. E. (2013). Intercomparison between Observed and Simulated Variability in Global Heat Content using Empirical Mode Decomposition, Part I: Modulated Annual Cycle. *Climate Dynamics*, doi:10.1007/s00382-012-1554-2.

8. Misra, V., Li, H., **Wu, Z.**, & DiNapoli, S. (2013). Global seasonal climate predictability in a two tiered forecast system: part I: boreal summer and fall seasons. *Climate Dynamics*, doi:10.1007/s00382-013-1812-y.
9. Huang, B., Hu, Z.-Z., Schneider, E. K., **Wu, Z.**, Xue, Y., & Klinger, B. (2012). Influences of subtropical air-sea interaction on the multidecadal AMOC variability in the NCEP climate forecast system. *Climate Dynamics*, **39**, 531-555. doi:10.1007/s00382-011-1258-z
10. Huang, B., Hu, Z.-Z., Kinter, J. L., III, **Wu, Z.**, & Kumar, A. (2012). Connection of stratospheric QBO with global atmospheric general circulation and tropical SST. Part I: Methodology and composite life cycle. *Climate Dynamics*, **38**, 1-23.
11. Huang, B., Hu, Z.-Z., Kinter, J. L., III, **Wu, Z.**, & Kumar, A. (2012). Connection of the stratospheric QBO with global atmospheric general circulation and tropical SST. Part II: Interdecadal variations. *Climate Dynamics*, **38**, 25-43. doi:10.1007/s00382-011-1073-6.
12. Zhu, J., Huang, B., & **Wu, Z.** (2012). The role of ocean dynamics in the interaction between the Atlantic meridional and equatorial modes. *Journal of Climate*, **25**, 3583-3598. doi:10.1175/JCLI-D-11-00364.1.
13. Bao, S., Pietrafesa, L. J., Huang, N. E., **Wu, Z.**, Dickey, D. A., Gayes, P. T., & Yan, T. (2011). An empirical study of tropical cyclone activity in the Atlantic and Pacific Oceans: 1851-2005. *Advances in Adaptive Data Analysis*, **3**, 291-307. doi:10.1142/S1793536911000866.
14. Fu, C., Qian[†], C., & **Wu, Z.** (2011). Projection of global mean surface air temperature changes in next 40 years: Uncertainties of climate models and an alternative approach. *Science China - Earth Sciences*, **54**, 1400-1406. doi:10.1007/s11430-011-4235-9.
15. Huang, N. E., Chen, X., Lo, M.-T., & **Wu, Z.** (2011). On Hilbert spectral representation: a true time-frequency representation for nonlinear and nonstationary data. *Advances in Adaptive Data Analysis*, **3**, 63-93. doi:10.1142/S1793536911000659.
16. Qian[†], C., Fu, C., & **Wu, Z.** (2011). Changes in the amplitude of the temperature annual cycle in China and their implication for climate change research. *Journal of Climate*, **24**, 5292-5302. doi:10.1175/JCLI-D-11-00006.1.
17. Qian[†], C., Fu, C., **Wu***, **Z.**, & Yan, Z. (2011). The role of changes in the annual cycle in earlier onset of climatic spring in northern China. *Advances in Atmospheric Sciences*, **28**, 284-296. doi:10.1007/s00376-010-9221-1.
18. Qian[†], C., **Wu***, **Z.**, Fu, C., & Wang, D. (2011). On changing El Nino: A view from time-varying annual cycle, interannual variability and mean state. *Journal of Climate*, **24**, 6486-6500. doi:10.1175/JCLI-D-10-05012.1.
19. Qian[†], C., Yan, Z., **Wu, Z.**, Fu, C., & Tu, K. (2011). Trends in temperature extremes in association with weather-intraseasonal fluctuations in eastern China. *Advances in Atmospheric Sciences*, **28**, 297-309. doi:10.1007/s00376-010-9242-9.

20. **Wu***, **Z.**, Huang, N. E., & Chen, X. (2011). Some considerations on physical analysis of data. *Advances in Adaptive Data Analysis*, **3**, 95-113. doi:I: 10.1142/S1793536911000660.
21. **Wu***, **Z.**, Huang, N. E., Wallace, J. M., Smoliak, B. V., & Chen, X. (2011). On the time-varying trend in global-mean surface temperature. *Climate Dynamics*, **37**, 759-773. doi:10.1007/s00382-011-1128-8.
22. Chang, Y.-M., **Wu, Z.**, Chang, J., & Huang, N. E. (2010). Model validation based on ensemble empirical mode decomposition. *Advances in Adaptive Data Analysis*, **2**, 415-428. doi:10.1142/S1793536910000562.
23. Chen, X., **Wu, Z.**, & Huang, N. E. (2010). The time-dependent intrinsic correlation based on the empirical mode decomposition. *Advances in Adaptive Data Analysis*, **2**, 233-265. doi:10.1142/S1793536910000471.
24. Qian[†], C., **Wu, Z.**, Fu, C., & Zhou, T. (2010). On multi-timescale variability of temperature in China in modulated annual cycle reference frame. *Advances in Atmospheric Sciences*, **27**, 1169-1182. doi:10.1007/s00376-009-9121-4.
25. Wang, G., Chen, X., Qiao, F., **Wu, Z.**, & Huang, N. E. (2010). On intrinsic mode function. *Advances in Adaptive Data Analysis*, **2**, 277-293. doi:10.1142/S1793536910000549.
26. **Wu***, **Z.**, & Huang, N. E. (2010). On the Filtering Properties of the Empirical Mode Decomposition. *Advances in Adaptive Data Analysis*, **2**, 397-414. doi:10.1142/S1793536910000604.
27. Yan, T., Pietrafesa, L. J., Dickey, D. A., Bao, S., Huang, N. E., & **Wu, Z.** (2010). North Atlantic ocean basin tropical cyclone activity as related to climate factors for the 2010 hurricane season. *Advances in Adaptive Data Analysis*, **2**, 463-508. doi:10.1142/S1793536910000586.
28. Hou, T. Y., Yan, M. P., & **Wu, Z.** (2009). A variant of the EMD method for multi-scale data. *Advances in Adaptive Data Analysis*, **1**, 483-516. doi:10.1142/S179353690900031X.
29. Huang, N. E., **Wu, Z.**, Long, S. R., Arnold, K. C., Chen, X., & Blank, K. (2009). On instantaneous frequency. *Advances in Adaptive Data Analysis*, **1**, 177-299. doi:10.1142/S1793536909000096.
30. Huang, N. E., **Wu, Z.**, Pinzón, J. E., Parkinson, C. L., Long, A. R., Blank, K., Gloersen, P., & Chen, X. (2009). Reductions of noise and uncertainty in annual global surface temperature anomaly data. *Advances in Adaptive Data Analysis*, **1**, 447-460. doi:10.1142/S1793536909000151.
31. Qian[†], C., Fu, C., & **Wu, Z.** (2009). On the secular change of spring onset at Stockholm. *Geophysical Research Letters*, **36**, L12706. doi:10.1029/2009GL038617.
32. Tsui, P. H., Chang, C. C., Ho, M. C., Lee, Y. H., Chen, Y. S., Chang, C. C., Huang, N. E., **Wu, Z.**, & Zhang, K. J. (2009). Use of Nakagami statistics and empirical mode

decomposition for ultrasound tissue characterization by a nonfocused transducer. *Ultrasound in medicine & biology*, **35**, 2055-2068.

33. **Wu***, **Z.**, Huang, N. E., & Chen, X. (2009). The multi-dimensional Ensemble Empirical Mode Decomposition method. *Advances in Adaptive Data Analysis*, **1**, 339-372. doi:10.1142/S1793536909000187.
34. **Wu***, **Z.**, & Huang, N. E. (2009). Ensemble Empirical Mode Decomposition: a noise-assisted data analysis method. *Advances in Adaptive Data Analysis*, **1**, 1-41. doi:10.1142/S1793536909000047.
35. Hu, K., Peng, C. K., Huang, N. E., **Wu, Z.**, Goldberger, A. L., Lipsitz, L. A., & Novak, V. (2008). Altered phase interactions between spontaneous blood pressure and flow fluctuations in type 2 diabetes mellitus: nonlinear assessment of cerebral autoregulation. *Physica A: Statistical Mechanics and its Applications*, **387**, 2279-2292. doi:hysa.2010.1016/j.p07.11.052.
36. Huang, N. E., & **Wu, Z.** (2008). A review on Hilbert-Huang transform: method and its applications to geophysical studies. *Reviews of Geophysics*, **46**, RG2006. doi:10.1029/2007RG000228.
37. **Wu***, **Z.**, Schneider, E. K., Kirtman, B. P., Sarachik, E. S., Huang, N. E., & Tucker, C. J. (2008). The modulated annual cycle: an alternative reference frame for climate anomalies. *Climate Dynamics*, **31**, 823-841. doi:10.1007/s00382-008-0437-z.
38. Yeh, J.-H., Lim, T.-Y., Shieh, J.-S., Huang, N. E., **Wu, Z.**, & Peng, C.-K. (2008). Investigating complex patterns of blocked intestinal artery blood pressure signals by empirical mode decomposition and linguistic analysis. *Journal of Physics: Conference Series*, **96**, 012153. doi:10.1088/1742-6596/96/1/012153.
39. Costa, M., Priplata, A. A., Lipsitz, L. A., Goldberger, A. L., Huang, N. E., **Wu, Z.**, & Peng, C. K. (2007). Noise and poise: enhancement of postural complexity in the elderly with a stochastic resonance-based therapy. *Europhysics letters*, **77**, EPL 68008. doi:10.1209/0295-5075/77/68008.
40. Li, H., Wang, C., Xu, Y., & Wu, Z. (2007). Time-frequency analysis of the vertical dynamics of the track-vehicle system using EEMD. *Chinese Railway Science*, **28**(5), 24-30.
41. **Wu***, **Z.**, Huang, N. E., Long, S. R., & Peng, C. K. (2007). On the trend, detrending, and variability of nonlinear and nonstationary time series. *Proceedings of the National Academy of Sciences of the United States of America*, **104**, 14889-14894. doi:10.1073/pnas.0701020104
42. Hu, Z.-Z., & **Wu, Z.** (2004). The Intensification and shift of the annual North Atlantic Oscillation in a global warming scenario simulation. *Tellus*, **52A**, 112-124. doi:10.1111/j.1600-0870.2004.00050.x.

43. **Wu***, **Z.**, & Hunag, N. E. (2004). A study of the characteristics of white noise using the Empirical Mode Decomposition method. *Proceeding of the Royal Society A: Mathematical, Physical, and Engineering Sciences*, **460**, 1597-1611. doi:10.1098/rspa.2003.1221.
44. **Wu***, **Z.**, & Moore, D. W. (2004). The completeness of eigenfunctions of the tidal equation on an equatorial beta plane. *Journal of the Atmospheric Sciences*, **61**, 769-774. doi:10.1175/1520-046(2004)061.
45. **Wu***, **Z.**, Schneider, E. K., & Kirtman, B. P. (2004). Causes of low frequency North Atlantic SST variability in a coupled GCM. *Geophysical Review Letters*, **31**, L09210. doi:1029/2004GL019548.
46. **Wu***, **Z.** (2003). A shallow CISK, deep equilibrium mechanism for the interaction between large-scale convection and large-scale circulations in the tropics. *Journal of the Atmospheric Sciences*, **60**, 377-392.
47. **Wu***, **Z.**, Sarachik, E. S., & Battisti, D. S. (2001). Thermally driven tropical circulations under Rayleigh friction and Newtonian cooling: analytical solutions. *Journal of the Atmospheric Sciences*, **58**, 724-741.
48. **Wu***, **Z.**, Battisti, D. S., & Sarachik, E. S. (2000). Rayleigh friction, Newtonian cooling, and the linear response to steady tropical heating. *Journal of the Atmospheric Sciences*, **57**, 1937-1957.
49. **Wu***, **Z.**, Sarachik, E. S., & Battisti, D. S. (2000). Vertical structure of convective heating and the three-dimensional structure of the forced circulation on an equatorial beta plane. *Journal of the Atmospheric Sciences*, **57**, 2169-2187.
50. **Wu***, **Z.**, Sarachik, E. S., & Battisti, D. S. (1999). Thermally forced Surface winds on an equatorial beta plane. *Journal of the Atmospheric Sciences*, **56**, 2029-2037.
51. Chen, X., Gao, G., & **Wu, Z.** (1991). The long wave radiation budget in the atmosphere over the North Pacific. *Journal of Nanjing University (Natural Sciences Edition)*, **27**, 623-629.

Invited and Refereed Book Chapters

52. **Wu***, **Z.**, (2014). Ensemble empirical mode decomposition and its multi-dimensional extensions. In N. E. Huang, & S. S. P. Shen (Eds.), *Hilbert-Huang Transform: Introduction and Applications* (2nd edition) (pp. 27-46). Singapore: World Scientific.
53. Shen, S. P., Shu, T., Huang, N. E., **Wu, Z.**, North, G. R., Carl, T. R., & Easterling, D. R. (2005). HHT analysis of the nonlinear and non-stationary annual cycle of daily surface air temperature data. In N. E. Huang, & S. S. P. Shen (Eds.), *Hilbert-Huang Transform: Introduction and Applications* (pp. 187-210). Singapore: World Scientific.

54. **Wu***, **Z.**, & Huang, N. E. (2005). Statistical significance test of intrinsic mode functions. In N. E. Huang, & S. S. P. Shen (Eds.), *Hilbert-Huang Transform: Introduction and Applications* (pp. 125-148). Singapore: World Scientific.

Invited and Refereed Encyclopedia Entries

55. Huang, N. E., **Wu, Z.**, & Long, S. R. (2008). Hilbert Huang Transform. In Editor-in-chief: Dr. Eugene Izhikevich (Eds.), *Scholarpedia*, **3**(7), http://www.scholarpedia.org/article/Hilbert-Huang_transform.

Non-refereed Proceedings

56. **Wu***, **Z.** (2004). Statistical significance test of Intrinsic Mode Functions. In *The 25th IUGG International Meeting on Mathematical Geophysics: Frontiers in Theoretical Earth Science* (pp. 89). IUGG.
57. **Wu***, **Z.** (2001). The role of shallow heating in driving tropical atmospheric circulations. In *13th Conference on Atmospheric and Oceanic Fluid Dynamics* (pp. 104-108). American Meteorological Society.
58. **Wu***, **Z.** (1999). The structure of the thermally forced circulations under different combinations of linear damping. In *12th Conference on Atmospheric and Oceanic Fluid Dynamics* (pp. 66-70). American Meteorological Society.
59. **Wu***, **Z.** (1999). Vertical structure of heating and the 3D structure of the forced circulations in the tropics. In *12th Conference on Atmospheric and Oceanic Fluid Dynamics* (pp. 152-156). American Meteorological Society.
60. **Wu***, **Z.**, Sarachick, E. S., & Battisti, D. S. (1997). Forced planetary waves on an equatorial beta-plane. In *11th Conference on Atmospheric and Oceanic Fluid Dynamics* (pp. 6-10). American Meteorological Society.

Non-refereed Summaries

61. Hurrell, J. W., Wu, Z., & Vimont, D. J. (2000). Summary of *Observations of extratropical variability*. Lecture notes for 2000 NCAR ASP on Decadal and Centennial Climate Variability. Retrieved from <http://www.asp.ucar.edu/colloquium/2000/Lectures/hurrell1.html>
62. Saravanan, R., Vimont, D. J., & Wu, Z. (2000). Summary of *Exotic mechanisms for coupled ocean-atmosphere variability in mid-latitudes*. Lecture notes for 2000 NCAR ASP on Decadal and Centennial Climate Variability. Retrieved from <http://www.asp.ucar.edu/colloquium/2000/Lectures/saravanan.html>

Technical Reports (Internally Refereed)

63. **Wu***, **Z.**, Kirtman, B. P., Schneider, E. K., Sarachik, E. S., Huang, N. E., & Tucker, J. (2007). *Amplitude-frequency modulated annual cycle: an alternative reference frame for climate anomaly* (COLA Technical Report 244). Institute of Global Environment and Society. Retrieved from <http://www.iges.org/pubs/tech.html>.
64. **Wu***, **Z.**, & Huang, N. E. (2005). *Ensemble Empirical Mode Decomposition: a noise-assisted data analysis method* (COLA Technical Report 193). Institute of Global Environment and Society. Retrieved from <http://www.iges.org/pubs/tech.html>.
65. **Wu***, **Z.**, Schneider, E. K., & Kirtman, B. P. (2004). *Causes of low frequency North Atlantic SST variability in a coupled GCM* (COLA Technical Report 160). Institute of Global Environment and Society. Retrieved from <http://www.iges.org/pubs/tech.html>.
66. **Wu***, **Z.**, & Huang, N. E. (2003). *A study of the characteristic of white noise using the Empirical Mode Decomposition method* (COLA Technical Report 133). Institute of Global Environment and Society. Retrieved from <http://www.iges.org/pubs/tech.html>.
67. Hu, Z.-Z., & **Wu**, **Z.** (2002). *The Intensification and shift of the North Atlantic Oscillation in a global warming scenario simulation* (COLA Technical Report 127). Institute of Global Environment and Society. Retrieved from <http://www.iges.org/pubs/tech.html>.
68. **Wu***, **Z.**, & Moore, D. W. (2002). *On the completeness of meridional eigenfunctions of tidal equation on an equatorial β -plane* (COLA Technical Report 118). Institute of Global Environment and Society. Retrieved from <http://www.iges.org/pubs/tech.html>.
69. **Wu***, **Z.** (2001). *A Shallow-CISK-Deep-Equilibrium mechanism for the interaction between large-scale convection and large-scale circulation in the tropics* (COLA Technical Report 104). Institute of Global Environment and Society. Retrieved from <http://www.iges.org/pubs/tech.html>.
70. **Wu***, **Z.**, Schneider, E. K., Hu, Z.-Z., & Cao, L. (2001). *The impact of global warming on ENSO variability in climate records* (COLA Technical Report 110). Institute of Global Environment and Society. Retrieved from <http://www.iges.org/pubs/tech.html>.

Patented Inventions

1. Huang, N. E., & Wu, Z. (2011). *Noise-assisted data analysis method, system and program product therefore*. US Patent No.: 7,941,298. Retrieved from <http://www.google.com/patents/US7941298>.

Contracts and Grants Funded

1. Wu, Z. (May 2012–Apr 2015). *Integration of the NASA CAMVis and Multiscale Analysis Package (CAMVis-MAP) for Tropical Cyclone Climate Study*. Funded by National Aeronautics and Space Administration. Total award \$266,028.
2. Wu, Z. (Jan 2012–Dec 2014). *Tempora-Spatial Evolutions of Low-Frequency Climate variability and warming trend*. Funded by National Science Foundation. Total award \$396,805.
3. Wu, Z. (Jan 2009–Apr 2011). *Collaborative Research: Understanding Observed Low-Frequency Variability of SST in the North Atlantic*. Funded by National Science Foundation. Total award \$90,026.
4. Wu, Z. (May 2007–Dec 2008). *Collaborative Research: Understanding Observed Low-Frequency Variability of SST in the North Atlantic*. Funded by National Science Foundation. (ATM-0653136). Total award \$493,014.
5. Schneider, E. K., Kirtman, B. P., & Wu, Z. (Feb 2004–Jan 2007). *Variability of the Climate System: Understanding Observed Low Frequency Variability of SST in the North Atlantic*. Funded by National Science Foundation. (ATM-0342104). Total award \$479,494.

SERVICE

FSU Department Service

- 2013- Computer Sub-Committee (Meteorology Program)
- 2011- Graduate Program Committee (Meteorology Program)

Reviewer for Refereed Journals

Nature; Science; AIAA Journal; Acta Oceanologica Sinica; Advances in Adaptive Data Analysis; Advances in Atmospheric Sciences; Annales Geophysicae; Atmosphere-Ocean; Biomedical Engineering-Applications, Basis and Communications; Climate Dynamics; Climatic Change; Climatic Research; Communications on Pure and Applied Analysis; Dynamics of Atmospheres and Oceans; EURASIP Journal on Advances in Signal Processing; Geophysical Research Letters; IEEE Signal Processing Letters; IEEE Transactions on Biomedical Engineering; IEEE Transactions on Image Processing; IEEE Transactions on Signal Processing; IET Image Processing; International Journal of Climatology; International Journal of Computational Methods; Journal of Applied Meteorology and Climatology; Journal of Climate; Journal of

Geophysical Research-Ocean; Journal of Marine Research; Journal of the Atmospheric Sciences; Journal of Vibration and Control; Mechanical Systems and Signal Processing; Mathematical Medicine and Biology; Monthly Weather Review; New Astronomy; Physica A; Quarterly Journal of the Royal Meteorological Society; Smart Materials and Structures; Studies in Nonlinear Dynamics & Econometrics; Theoretical and Applied Climatology.

Juror for a Performance

AGU Fall Meeting Outstanding Student Paper Awards. San Francisco: American Geophysical Union (2010, 2013).

Reviewer or Panelist for Grant Applications

NSF, NOAA, NASA

Service to Professional Associations

- 2010- Scientific Advisory Committee Member, the key Laboratory of the Data Analysis and Applications of the State Oceanic Administration of China.
- 2011 Scientific Advisory Committee Member, the Third International Conference on the Advances of Hilbert-Huang Transform and Its Applications, Qingdao, P. R. China.
- 2006 Organizing Committee Member, the First International Conference on the Advances of Hilbert-Huang Transform and Its Applications, National Central University, Chung-Li, Taiwan.

Service to Other Universities

- 2007- Visiting (Adjunct) Professor, *National Central University.*