

SHUANG XU

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EDUCATION

Hampton University (HU)

Hampton, VA, USA

- Ph.D. in Atmospheric Science

Sep. 2019–2023 (expect)

University of Science and Technology of China (USTC)

Hefei, Anhui, China

- Master of Science
- Major: Geophysics

Sep. 2016–Jun. 2019

Sun Yat-sen University (SYSU)

Guangzhou, Guangdong, China

- Bachelor of Science
- Major: Geography Information System

Sep. 2012–Jun. 2016

AREAS OF EXPERTISE

Atmospheric gravity waves, Stratospheric dynamics, Mesosphere and Lower Thermosphere (MLT) region dynamics, Satellite data application

PUBLICATIONS

1. Miller, S.D., W. Straka III, J. Yue, C. Seaman, **S. Xu**, C. Elvidge, L. Hoffmann, and I. Azeem (2018), *The Dark Side of Hurricane Matthew—Unique Perspectives from the Day/Night Band*, **Bulletin of the American Meteorological Society**, **2561–2574**, doi:10.1175/BAMS-D-17-0097.1
2. Huang, A., G. Lu, J. Yue, W. Lyons, F. Lucena, F. Lyu, S. Cummer, W. Zhang, L. Xu, X. Xue, **S. Xu** (2018), *Observations of red sprites above Hurricane Matthew*, **Geophysical Research Letters**, **45**, 13158–13165, doi:10.1029/2018GL079576
3. **Xu, S.**, J. Yue, X. Xue, S.L. Vadas, S. Miller, I. Azeem, W. Straka, L. Hoffmann and S. Zhang (2019), *Dynamical coupling between Hurricane Matthew and the Middle to Upper Atmosphere via gravity waves*. **Journal of Geophysical Research: Space Physics**, **124**. doi:10.1029/2018JA026453
4. Vadas, S.L., **S. Xu**, J. Yue, K. Bossert, E. Becker, & G. Baumgarten. (2019). *Characteristics of the Quiet-time Hotspot Gravity Waves Observed by GOCE over the Southern Andes on 5 July 2010*, **Journal of Geophysical Research: Space Physics**. doi:10.1029/2019ja026693
5. Yue, J., S. Perwitasari, **S. Xu**, Y. Hozumi, T. Nakamura, T. Sakanoi, A. Saito, S.D. Miller, W. Straka, P. Rong (2019), *Preliminary Dual-Satellite Observations of Atmospheric Gravity Waves in Airglow*, **Atmosphere** **10(11)**: 650, doi:10.3390/atmos10110650
6. **Xu, S.**, S.L. Vadas, J. Yue (2021), *Thermospheric Traveling Atmospheric Disturbances in Austral Winter from GOCE and CHAMP*, **Journal of Geophysical Research: Space Physics**, doi:10.1029/2021JA029335
7. **Xu, S.**, J. Carstens, J.A. France, C.E. Randall, J. Yue, V.L. Harvey, J. Gong, J. M. Russell (2022), *A global view of stratopause gravity waves derived from CIPS RAA data. (In preparation, plan to be submitted to Journal of Geophysical Research: Earth and Space Science before November 2022)*

8. **Xu, S.,** S.L. Vadas, E. Becker, J. Yue, (2023), *Generation and Propagation of the Quiet-Time Thermospheric Gravity Waves Observed by GOCE and CHAMP* (in preparation)

CONFERENCES

1. Volunteer and poster session in the 10th Workshop on Long-term Changes and Trends in the Atmosphere
May 14–18, 2018 Hefei, China
2. Oral presentation in the 5th Young Scientist Forum of Earth Science
Oct. 26–29, 2018 Nanjing, China
3. Poster presentation in AGU 2020 Fall Meeting Dec. 1–17, AGU Fall 2020, SA008-0012 (Virtual)
4. Poster presentation in 2021 CEDAR Workshop Jun. 20–25, 2021 (Virtual)
5. Poster presentation in AGU 2021 Fall Meeting Dec. 13–17, AGU Fall 2021, SA45A-2185 (Virtual)
6. Poster presentation in the SPARC 2022 Gravity Wave Symposium
Mar. 28–Apr. 1, SPARC 2022 (Virtual)
7. Oral presentation in Hampton University School of Science 26th Annual Research Symposium
Apr. 7–8, 2022 (Virtual)
8. Poster and oral presentations in 2022 CEDAR Workshop Jun. 19–24, 2022, Austin, TX
9. Talk presentations in 2022 AIM Science Team Meeting Jul. 19–21, 2022, Blacksburg, VA

RELEVANT COURSES

Atmospheric Physics	Atmospheric Chemistry
Atmospheric Radiative Transfer	Math Methods of Physics
Atmospheric measurements	Principles of Planetary Science
Geophysical Fluid Dynamics	Winter 2020 WRF Tutorial

COMPUTER SKILLS

- IDL, MATLAB, Basic Linux, Basic Python

SYNERGISTIC ACTIVITY

- Teaching assistant, Fall Semester 2021 (HU undergraduate course: APS 101 – Introduction to Weather and Climate, teacher: Dr. Robert Loughman)

SELECTED RESEARCH EXPERIENCE

Ray-tracing model of gravity waves Feb.–Jun. 2016
Dr. Xianghui Xue, School of Earth and Space Sciences, USTC Hefei, Anhui, China

- Developed a *Preliminary Ray-tracing model of gravity waves in upper atmosphere*

Dynamical Coupling between Hurricane Matthew and the Middle to Upper Atmosphere via Gravity Waves Sep. 2017–Jan. 2019

Dr. Jia Yue, Center for Atmospheric Sciences, HU Hampton, VA, USA

Dr. Xianghui Xue, School of Earth and Space Sciences, USTC Hefei, Anhui, China

- Publications: see 1, 2, 3 in Publications.
- Key points: 1) GW generated by Hurricane Matthew were seen from the tropopause to the ionosphere with horizontal wavelengths of ~200–300 km in Oct. 2016. 2) Both small and large scale GW patterns seen in DNB and GPS TEC observations correlated with Hurricane Matthew's most intense period. 3) Hurricane induced concentric TID could not directly propagate to over ~470 km altitude using

dispersion relationship with viscosity considered.

Thermospheric Gravity Waves Observed by GOCE and CHAMP satellites Sep. 2019–Present

Dr. Sharon L. Vadas, Northwest Research Associates, Boulder, Colorado, USA.

Dr. Jia Yue, NASA Goddard Space Flight Center Greenbelt, MD, USA

- Publications: see 4, 6, 8 (under preparation) in Publications.
- Key points: 1) GOCE thermospheric traveling atmospheric disturbances in austral winter are mainly induced by orographic waves during geomagnetic quiet time. 2) Medium and large scale traveling atmospheric disturbances in CHAMP create a bipolar distribution in austral winter quiet time. 3) Traveling atmospheric disturbances during geomagnetic activities are likely caused by aurora generated gravity wave

Stratopause gravity waves climatology derived from CIPS RAA data Jan. 2021–Present

Dr. Cora E. Randall LASP, University of Colorado Boulder, Boulder, Colorado, USA

Dr. Justin Carstens Virginia Polytechnic Institute and State University, Blacksburg, Virginia, USA,

- Publications: see 7 (under preparation) in Publications.
- Key points: 1) The CIPS RAA observations occupy a unique spatial and temporal niche in providing information about the vertical propagation of GWs from the lower atmosphere into the mesosphere. 2) In order to facilitate quantitative analyses using CIPS RAA data and to reduce the random noise in the CIPS scenes, we have developed a variance data product that uses a Fast Fourier Transform (FFT) window filter. The RAA variances provide a quantitative measure of wave-driven fluctuations that can be used in automated analyses targeting GWs.

SELECTED AWARDS AND HONORS

- SYSU Scholarship (Third grade, top 20%) Academic year 2013–2014
- USTC Academic Scholarship for graduate student (Second grade) 2018
- Hampton University School of Science 26th Annual Research Symposium, the first place of graduate student presentation award Virtual, April 7–8, 2022