

Curriculum Vita for Sharon L. Vadas

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Education:

B.A. Physics & Chemistry	Univ. of Rochester	1987
M.A. Physics	Univ. of Chicago	1990
Ph.D. Physics	Univ. of Chicago	1993

Experience:

2010-present	Senior Research Scientist	NWRA/CoRA office
1997-2010	Research Scientist	NWRA/CoRA office
1995-1997	Postdoctoral Fellow	LASP, Univ of Colorado, Boulder
1993-1995	President's Postdoctoral Fellow	Univ. of California, Berkeley
1993	Guest Scientist	Fermi National Accelerator Lab
1987-1993	Graduate student	University of Chicago
1983-1987	Undergraduate student	University of Rochester

Honors:

2008-CEDAR Prize Lecture, "The coupling of the lower atmosphere to the thermosphere via gravity wave excitation, propagation and dissipation" CEDAR workshop, Utah, June

Associate Editor, JGR Space Physics---1 January 2010 - 31 December 2014.

CSSC (Cedar Steering Committee) Member, 2011-2014

Reviewer for JGR Space Physics and Atmospheres, GRL, JASTP, JAS, and AG.

NASA and NSF proposal reviewer and panel review member

Papers Submitted to Peer-Reviewed Journal (under review):

Xu, S, S. L. Vadas and J. Yue, "Thermospheric gravity waves observed by GOCE and CHAMP", in preparation, JGR Space Physics, submitted August 2023, minor revisions.

Stober, G., S.L. Vadas, E. Becker, A. Liu, A. Kozlovsky, D. Janches, Z. Qiao, W. Krochin et al., "Gravity waves generated by the Hunga Tonga-Hunga Ha'apai volcanic eruption and their global propagation in the mesosphere/lower thermosphere observed by meteor radars and modeled with the High-Altitude General Mechanistic Circulation Model", under review

Horváth, A., S.L. Vadas, C. C. Stephan, and S.A. Buehler, "One-minute resolution GOES-R observations of Lamb and gravity waves triggered by the Hunga Tonga-Hunga Ha'apai Eruptions on 15 January 2022", *JGR Atmospheres*, under review.

Papers In Press (peer-reviewed):

NA

Peer-reviewed Publications:

Figueiredo, C.A.O.B., Vadas, S.L., Becker, E., Wrasse, C. M., Takahashi, H., Nyassor, P. K., and Barros, D. (2023b), "Secondary gravity waves from the Tonga volcano eruption: Observation and modeling over New Zealand and Australia", *JGR Space Physics*, 128, e2023JA031476. doi.org/10.1029/2023JA031476.

Figueiredo, C.A.O.B., C.M. Wrasse, S.L. Vadas, H. Takahashi, Y. Otsuka, P. K. Nyassor, K. Shiokawa, I. Paulino, and D. Barros, (2023a), "Daytime medium scale traveling ionospheric disturbances (MSTIDS) over the Andes Mountains at equatorial and low magnetic latitudes", *JGR Space Physics*, 128, e2023JA031477, doi.org/10.1029/2023JA031477.

Günzkofer, F., D. Pokhotelov, G. Stober, I. Mann, S. L. Vadas, E. Becker, A. Tjulin, A. Kozlovsky, M. Tsutsumi, N. Gulbrandsen, S. Nozawa, M. Lester, E. Belova, J. Kero, N.J. Mitchell, and C. Borries (2023), "Inferring neutral winds in the ionospheric transition region from atmospheric-gravity-wave traveling-ionospheric-disturbance (AGW-TID) observations with the EISCAT VHF radar and the Nordic Meteor Radar Cluster", *Annales Geophysicae*, 41, 409–428, doi.org/10.5194/angeo-41-409-2023.

Vadas, S. L., C.A.O.B. Figueiredo, E. Becker, J. D. Huba, D. R. Themens, N. Hindley, S. Mrak, I. Galkin and K. Bossert (2023c), "Traveling ionospheric disturbances induced by the secondary gravity waves from the Tonga eruption on 15 January 2022: Modeling with MESORAC-HIAMCM-SAMI3 and comparison with GPS/TEC and ionosonde data", *JGR Space Physics*, 128, e2023JA031408, doi.org/10.1029/2023JA031408.

Vadas, S. L., E. Becker, C.A.O.B. Figueiredo, K. Bossert, B. Harding, L.C. Gasque (2023b), "Primary and secondary gravity waves and large-scale wind changes generated by the Tonga volcanic eruption on 15 January 2022: Modeling and comparison with ICON-MIGHTI winds", *JGR Space Physics*, 128, e2022JA031138. doi.org/10.1029/2022JA031138

Vadas, S. L., Becker, E., Bossert, K., Baumgarten, G., Hoffmann, L., & Harvey, V. L. (2023a), "Secondary gravity waves from the stratospheric polar vortex over ALOMAR observatory on 12–14 January 2016: Observations and modeling", *JGR Atmospheres*, 128, e2022JD036985. doi.org/10.1029/2022JD036985

Huba, J. D., Becker, E., & Vadas, S. L. (2023), "Simulation study of the 15 January 2022 Tonga event: Development of super equatorial plasma bubbles", *Geophysical Research Letters*, 50, e2022GL101185. doi.org/10.1029/2022GL101185

Yang, H., M. Hernandez-Pajares, W. Jarmołowski, P. Wielgosz, S.L. Vadas, *et al.*, (2022), "Systematic detection of anomalous ionospheric perturbations above LEOs From GNSS POD data including possible tsunami signatures", *IEEE Transactions on Geoscience and Remote Sensing*, **60**, 1-23, 5803423, doi:10.1109/TGRS.2022.3182885.

Heale, C. J., Bossert, K., & Vadas, S. L. (2022), "3D numerical simulation of secondary wave generation from mountain wave breaking over Europe", *JGR Atmospheres*, **127**, e2021JD035413. <https://doi.org/10.1029/2021JD035413>

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Becker, E., S.L. Vadas, K. Bossert, L. Harvey, C. Zulicke, and Lars Hoffmann (2022a), "A high-resolution whole-atmosphere model with resolved gravity waves and specified large-scale dynamics in the troposphere and stratosphere", *JGR Atmospheres*, **127**, e2021JD035018, <https://doi.org/10.1029/2021JD035018>.

Xu, S., Vadas, S. L., & Yue, J. (2021), "Thermospheric traveling atmospheric disturbances in austral winter from GOCE and CHAMP", *JGR Space Physics*, **126**, e2021JA029335. <https://doi.org/10.1029/2021JA029335>

Nyassor, P. K., Wrasse, C. M., Gobbi, D., Paulino, I., Vadas, S. L., Naccarato, K. P., et al. (2021). "Case studies on concentric gravity waves source using lightning flash rate, brightness temperature and backward ray tracing at São Martinho da Serra (29.44°S, 53.82°W)", *Journal of Geophysical Research: Atmospheres*, **126**, e2020JD034527. doi.org/10.1029/2020JD034527

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Holman, R., E.W. Kolb, S.L. Vadas, Y. Wang, (1991), “Scale-Invariant Extended Inflation”, *Phys. Rev D*, **43**, 3833-3845.

Holman, R., E.W. Kolb, S.L. Vadas, Y. Wang, (1991), “Extended Inflation From Higher Dimensional Theories”, *Phys. Rev D*, **43**, 995-1004.

Holman, R., E.W. Kolb, S.L. Vadas, Y. Wang, (1990), “False-Vacuum Decay in Generalized Extended Inflation”, *Phys. Lett.*, **250B**, 24-28.

Holman, R., E.W. Kolb, S.L. Vadas, Y. Wang, E. Weinberg, (1990), “False Vacuum Decay in Jordan-Brans-Dicke Cosmologies”, *Phys. Lett.*, **237B**, 37-42.

Takagi, K., B.R. Suddaby, S.L. Vadas, C.A. Backer and D.G. Whitten, (1986), “Topological Control of Reactivity by Interfacial Orientation: Excimer Fluorescence and Photodimerization of 4-Stillbazolium Cations in Aerosol OT Reversed Micelles”, *Jour.Am.Chem.Soc.*, **108**, 7865-7867.

Invited Keynote Lectures:

SCOSTEP, 12th Solar-Terrestrial Physics Symposium, “Thermospheric response to gravity wave coupling from below”, Berlin, Germany, July, 2010

Invited Plenary Talks:

SCOSTEP, 14th Solar-Terrestrial Physics Symposium, “Gravity wave penetration into the thermosphere and ionosphere”, Toronto, Canada, July, 2018

Invited Conference Talks:

CEDAR, 2023, in “2023 Grand Challenge Workshop: Gravity waves in the upper atmosphere and ionosphere; The role of gravity waves in the mesosphere, thermosphere and ionosphere cross-scale coupling and irregularities: Observations and numerical simulations”, talk entitled “Secondary and tertiary GW simulation in thermosphere”, 26 Monday, 29 June 2023

AGU in “Space Weather Challenges in the Near-Earth Geospace”, talk entitled "Modeling and observation of primary and higher-order gravity waves from the wintertime polar vortex", 13 December 2022.

AGU in "Atmosphere-Ionosphere response to the 2022 Hunga Tonga- Hunga Ha'apai volcanic eruption", talk entitled "Modeling the primary and secondary gravity waves and mean wind changes from the Tonga eruption, and comparison with data", 14 December 2022.

3rd CGS Workshop, talk entitled "Impacts of gravity waves on the IT system", 14 November 2022.

CEDAR, 2022, in “High-Latitudes Space-Atmosphere Coupling and Wave Dynamics”, talk entitled “Heat fluxes of gravity waves with non-zero vertical wavelengths, and connection to secondary gravity waves excited by local body forces from momentum deposition: comparison of fully compressible and Boussinesq solutions”, June 22, 2022.

SPARC GW symposium, talk entitled “Gravity waves in the mesosphere and thermosphere from mountain waves and the polar vortex via multi-step vertical coupling”, 28 March 2022.

AMS, Space Weather Conference, 2022, in “Coupling between the Lower and Upper Atmosphere and Ionosphere”, talk entitled “Primary, secondary and higher-order gravity waves in the thermosphere and F region from various sources via multi-step vertical coupling”, January 24, 2022.

AGU, in “Atmosphere-Ionosphere-Magnetosphere (AIM) Coupling From High to Low Latitudes II”, talk entitled “Multi step vertical coupling via gravity waves in the Earth's atmosphere”, 15 December 2021 (I believe this was an invited talk by Xinzhao Chu).

CEDAR, 2021, talk in “Interhemispheric IT asymmetries and their causes and effects”, June 24, 2021.

ISWAT-COSPAR, "Gravity Waves in IT", online, 25 February, 2021.

Geospace Discovery Science Workshop, "Effects of small and medium-scale gravity waves on the background neutral winds and tidal generation in the thermosphere", 9 February, 2021.

International Symposium on Physics (ISP), "Atmospheric Gravity Waves in the Earth's Atmosphere", 17 December 2020.

MS-GWaves workshop, "Primary and secondary gravity waves in the lower and middle atmosphere", Kassel, Germany, 2018.

IWSA Symposium, "The vertical coupling of the lower to upper atmosphere via atmospheric gravity waves", Tokyo, 2016.

IUGG, IAGA Symposium, Coupling Processes in the Atmosphere-Ionosphere System, “Local and global changes to the thermosphere and ionosphere from the dissipation of gravity waves from deep convection”, Prague, 2015.

COSPAR (C2.2), “Ray Tracing Modeling of Gravity Wave Propagation and Dissipation”, in Wave Coupling Processes in the Whole Atmosphere, Russia, August, 2014

COSPAR (C1.1), “Model study of the effects of gravity wave dissipation on the thermosphere and ionosphere from deep convection worldwide”, in Recent Advances in Equatorial, Low- and Mid-latitude Mesosphere, Thermosphere and Ionosphere Studies, Russia, August, 2014

COSPAR (C1.1), “Effects of gravity wave dissipation on the thermosphere and ionosphere from deep convection: Excitation of secondary gravity waves, and large-scale changes to the background neutral wind and temperature”, in Recent Advances in Equatorial, Low- and Mid-latitude Mesosphere, Thermosphere and Ionosphere Studies, India, July, 2012

CEDAR-GEM Workshop, 2011, “Differences in propagation and dissipation of gravity waves during SC24”, High speed streams workshop, 30 June, 2011

CEDAR-GEM workshop, 2011, “The phases and amplitudes of gravity waves propagating and dissipating in the thermosphere, and its application to Fabry Perot and PFISR observations on 9-10 January 2010 in Alaska”, Thermospheric Winds workshop, 28 June, 2011

AGU (SA09): “The excitation, propagation and dissipation of secondary gravity waves excited by mountain wave breaking” , SA21B-05, 14 December, 2010

COSPAR (C1.1) “Secondary gravity waves near the mesopause: fingerprints of thermospheric dynamics” in Recent Advances in Equatorial, Low- and Mid-latitude Mesosphere, Thermosphere and Ionosphere Studies, Bremen, Germany, July, 2010

COSPAR (C2.2) “Gravity Wave Propagation into the Thermosphere from Deep Convection” in Troposphere to Ionosphere Multi-Scale Wave Coupling Processes, Bremen, Germany, July, 2010

IAGA, ICDC Symposium, (DC.01), “The Response of the Thermosphere and Ionosphere to the Dissipation of Gravity Waves Generated from Deep Convection” in Atmospheric coupling processes in the equatorial region, Sopron, Hungary, August, 2009

2009 Joint Assembly: “Convective Coupling Between the Lower Atmosphere and the Thermosphere/Ionosphere” in Coupling Between the Lower and Upper Atmosphere, Toronto, May 26, 2009

ISEA-12, Session S8 : Coupling processes at low- and mid-latitudes, Crete, May 22, 2008.

IUGG, IAGA/ICMA JAS007 Symposium, Response of the Atmosphere/Ionosphere Coupling System to Forcing from the Sun and the Lower Atmosphere, “Response of the atmosphere/ionosphere coupling system to forcing from the sun and the lower atmosphere”, Perugia, Italy, 2007.

36th COSPAR Scientific Assembly, C2.2 , Tides, Waves and Coupling Processes from Troposphere to Ionosphere, “Coupling of the lower atmosphere to the thermosphere via gravity waves”, Beijing, China, 2006.

34th COSPAR Scientific Assembly, C2.1, Middle Atmosphere Structure and Dynamics, “Body Forcing as a Source of Gravity Waves”, Houston, Texas, October, 2002.

The 17th Texas Symposium for Relativistic Astrophysics, “The Signatures of Voids and the CMBR”, Munich, Germany, December 1994.

Numerical Simulations in Astrophysics, “The Evolution of Superhorizon-sized Voids in the Early Universe”, Mexico City, July 1993.

Invited Colloquium/Talks:

University of Colorado, Boulder, LASP, “Gravity waves and traveling ionospheric disturbances in the stratosphere, mesosphere and thermosphere from mountain waves, the polar vortex, the Tonga eruption and deep convection via multi-step vertical coupling”, 6 April 2023.

University of California Los Angeles (UCLA), Department of Atmospheric & Oceanic Sciences, “Gravity waves and travelling ionospheric disturbances in the stratosphere, mesosphere and thermosphere from mountain waves, the polar vortex and deep convection via multi-step vertical coupling”, September 19, 2022 (online).

International Symposium on Physics (ISP), "Atmospheric Gravity Waves in the Earth's Atmosphere", Brazil (zoom), 17 December 2020.

Tokyo University, Dept. of Earth & Planetary Science, "Secondary and tertiary gravity waves from momentum deposition in the stratosphere, mesosphere, and thermosphere", Tokyo, Japan, 21 October 2019.

Stockholm University, MISU, "Secondary and tertiary gravity waves from momentum deposition in the stratosphere, mesosphere, and thermosphere", Stockholm, Sweden, 13 August, 2019

IAP, Leibniz-Institute of Atmospheric Physics, "Primary, secondary and tertiary gravity waves in the lower, middle and upper atmosphere", Kühlungsborn, Germany, 12 September 2018.

LASP Thermosphere-Ionosphere Seminar Series, CU Boulder, "Secondary and tertiary gravity waves in the thermosphere from stratospheric body forces created by the breaking and attenuation of mountain waves, April 2018.

IAP, Leibniz-Institute of Atmospheric Physics, "Gravity waves and their effects on the thermosphere and ionosphere", Kühlungsborn, Germany, 04 March 2016.

INPE, Brazil, "Deep convection as a source of gravity waves in the mesosphere and thermosphere: modeling and observations", 01 March, 2012.

University of Colorado, Physics Dept. colloquium, Fort Collins, CO, November 10, 2008.

Clemson University, Physics Dept. colloquium, Clemson, SC, 2007.

University of Colorado, 2007.

High Altitude Observatory, NCAR, Boulder, CO, 1996.

University of California at San Diego, San Diego, CA, 1994.

University of California at Santa Barbara, Santa Barbara, CA, 1995.

Tufts University, Physics Dept., 1993.

University of Pennsylvania, Physics Dept., Philadelphia, PA, 1993.

Conference Proceedings (non peer-reviewed papers):

Vadas, S. L. and H.-L. Liu, 2011, "Neutral winds and densities at the bottomside of the F layer from primary and secondary gravity waves from deep convection", *Aeronomy of the Earth's atmosphere and ionosphere*, Springer.

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