

## Journal Publications

### 2020

Balasubramaniam, R., C. Ruf, "Characterization of Rain Impact on L-Band GNSS-R Ocean Surface Measurements," *Remote Sensing of Environment*, 239(15), doi: 10.1016/j.rse.2019.111607, 2020.

Clarizia, M.P., C.S. Ruf, "Statistical Derivation of Wind Speeds from CYGNSS Data," *IEEE Trans. Geosci. Remote Sens.*, doi: 10.1109/TGRS.2019.2959715, 2020.

Gleason, S., A. O'Brien, A. Russel, M.M. Al-Khaldi, J.T. Johnson, "Geolocation, Calibration and Surface Resolution of CYGNSS GNSS-R Land Observations," *Remote Sensing*, doi: 10.3390/rs12081317, 12, 1317, 2020.

Hoseini, M, M. Asgarimehr, V. Zavorotny, H. Nahavandchi, C. Ruf, J. Wickert, "First Evidence of Mesoscale Ocean Eddies Signature in GNSS Reflectometry Measurements," *Remote Sensing*, doi: 10.3390/rs12030542, 12(3), 542, 2020.

Mayers, D., and C. S. Ruf, "Estimating the True Maximum Sustained Wind Speed of a Tropical Cyclone from Spatially Averaged Observations," *J. Appl. Meteor. Climatol.*, doi: 10.1175/JAMC-D-19-0177.1, 2020.

### 2019

Asgarimehr, M., J. Wickert, and S. Reich (2019). "Evaluating Impact of Rain Attenuation on Space-borne GNSS Reflectometry Wind Speeds". In: *Remote Sensing* 11.9, p. 1048. DOI: 10.3390/rs11091048.

Asgarimehr, M., I. Zhelavskaya, G. Foti, S. Reich, and J. Wickert (2019). "A GNSSR Geophysical Model Function: Machine Learning for Wind Speed Retrievals". *IEEE Geoscience and Remote Sensing Letters*, doi: 10.1109/LGRS.2019.2948566

Cardellach, E, W. Li, A. Rius, M. Semmling, J. Wickert, C. Ruf, C. Buontempo, "First Precise Spaceborne Sea Surface Altimetry With GNSS Reflected Signals," *IEEE J. Sel. Topics Appl. Earth Obs. Remote Sens.*, doi: 10.1109/JSTARS.2019.2952694, 2019.

Cui, Z., Z. Pu, V. Tallapragada, R. Atlas, C. S. Ruf, "A Preliminary Impact Study of CYGNSS Ocean Surface Wind Speeds on Numerical Simulations of Hurricanes," *Geophys. Res. Ltrs.*, doi: 10.1029/2019GL082236, 2019.

Gerlein-Safdi, C., C. S. Ruf, "A CYGNSS-Based Algorithm for the Detection of Inland Waterbodies," *Geophys. Res. Ltrs.*, doi: 10.1029/2019GL085134, 2019.

Gleason, S., J. Johnson, C. Ruf, C. Bussy-Virat, “Characterizing Background Signals and Noise in Spaceborne GNSS Reflection Ocean Observations,” *IEEE Geosci. Remote Sens. Ltrs.*, doi: 10.1109/LGRS.2019.2926695, 2019.

Hwang, P. A., 2019: Surface foam and L-band microwave radiometer measurements in high winds. *IEEE Trans. Geos. Rem. Sens.*, doi: 10.1109/TGRS.2018.2876972 (in press).

Mayers, D., and C. S. Ruf, “Tropical Cyclone Center Fix using CYGNSS Winds,” *J. Appl. Meteor. Climatol.*, doi: 10.1175/JAMC-D-19-0054.1, 2019.

Ruf, C. S., S. Asharaf, R. Balasubramaniam, S. Gleason, T. Lang, D. McKague, D. Twigg, D. Waliser, “In-Orbit Performance of the Constellation of CYGNSS Hurricane Satellites,” *Bull. Amer. Meteor. Soc.*, 2009-2023, doi: 10.1175/BAMS-D-18-0337.1, Oct. 2019.

Warnock, A., C. Ruf, “Response to Variations in River Flowrate by a Spaceborne GNSS-R River Width Estimator,” *Remote Sens.*, 11(20), 2450, doi: 10.3390/rs11202450, 2019.

## 2018

Anguelova, M. D., and P. Huq (2018) Effects of Salinity on Bubble Cloud Characteristics. *J. Mar. Sci. Eng.*, 6(1), 1, doi:10.3390/jmse6010001.

Asgarimehr et al. (2018), “TDS-1 GNSS Reflectometry: Development and Validation of Forward Scattering Winds”. *IEEE J. Selected Topics Applied Earth Obs. Remote Sens.*, 11(11): 4534–4541, doi: 10.1109/JSTARS.2018.2873241.

Asgarimehr, M., V. Zavorotny, J. Wickert, and S. Reich (2018). “Can GNSS Reflectometry Detect Precipitation Over Oceans?” *Geophysical Research Letters* 45.22, pp. 12–585. DOI: 10.1029/2018GL079708.

Burrage, D. M., M. D. Anguelova, D. W. Wang, and J. C. Wesson (2018) Modeling L-Band Reflection and Emission From Seawater, Foam, and Whitecaps Using the Finite-Difference Time-Domain Method, (GRSL, Early Access)

Bussy-Virat, C. D., C. S. Ruf, A. J. Ridley, “Relationship between temporal and spatial resolution for a constellation of GNSS-R satellites,” *IEEE J. Sel. Topics Appl. Earth Obs. Remote Sens.*, doi: 10.1109/JSTARS.2018.2833426, 2018.

G. Giangregorio, P. Addabbo, C. Galdi and M. d. Bisceglie, “Ocean Wind Speed Estimation From the GNSS Scattered Power Function Volume,” in *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*.

Gleason, S., C. S. Ruf, A. O’Brien, D. S. McKague, “The CYGNSS Level 1 Calibration Algorithm and Error Analysis Based On On-Orbit Measurements,” *IEEE J. Sel. Topics Appl. Earth Obs. Remote Sens.*, doi: 10.1109/JSTARS.2018.2832981, 2018.

Hoover, K. E., J. R. Mecikalski, T. J. Lang, X. Li, T. J. Castillo, and T. Chronis, 2018: Use of an End-to-End-Simulator to analyze CYGNSS. *J. Atmos. Oceanic. Technol.*, doi: 10.1175/JTECH-D-17-0036.1.

Hwang, P. A., and Y. Fan, 2018: Low-frequency mean square slopes and dominant wave spectral properties: Toward tropical cyclone remote sensing. *IEEE Trans. Geos. Rem. Sens.*, 56, 7359-7368, doi: 10.1109/TGRS.2018.2850969.

Hwang P. A. and E. J. Walsh. (2018) Propagation Directions of Ocean Surface Waves inside Tropical Cyclones. *Journal of Physical Oceanography* 48:7, 1495-1511.

Hwang, P. A. and E. J. Walsh (2018). Estimating Maximum Significant Wave Height and Dominant Wave Period inside Tropical Cyclones. *Weather and Forecasting*. 33. 10.1175/WAF-D-17-0186.1.

Hwang, P. A., 2018: High wind drag coefficient and whitecap coverage derived from microwave radiometer observations in tropical cyclones. *J. Phys. Oceanogr.*, 48, 2221-2232, doi: 10.1175/JPO-D-18-0107.1.

Kim, D., E.D. Maloney, and C. Zhang, 2018: Review: MJO Propagation over the Maritime Continent, *The Global Monsoon System, 4th Edition*, C.-P. Chang et al., Eds., submitted.

Krien, Y., G. Arnaud, R. Cécé, C. Ruf, A. Belmadani, J. Khan, D. Bernard, A.K.M.S. Islam, F. Durand, L. Testut, P. Palany, N. Zahibo, "Can we improve parametric cyclonic wind fields using recent satellite remote sensing data?," *Remote Sensing*, 10, 1963, doi:10.3390/rs10121963, 2018.

Li, Xiaowen, M. Janiga, S. Wang, W.-K. Tao, A. Rowe, W. Xu, C. Liu, T. Matsui, 2018: Evolution of precipitation structure during the November DYNAMO MJO event: Cloud-resolving model inter-comparison and cross-validation using radar observations. *J. Geophys. Res.* **123**. <https://doi.org/10.1002/2017JD027775>.

Li, W., E. Cardellach, F. Fabra, S. Ribó and A. Rius, Lake Level and Surface Topography Measured with Spaceborne GNSS-Reflectometry from CYGNSS Mission: Example for the Lake Qinghai, *GRL* accepted Dec 2018

Riley Dellaripa, E. M., E. D. Maloney, B. Toms, S. Saleeby, and S. C. van den Heever, 2018: The Importance of Topography to the Luzon Diurnal Cycle During a BSISO Event. *J. Atmos. Sci.*, submitted.

Ruf, C. S., Chew, C., Lang, T., Morris, M. G., Nave, K., Ridley, A., & Balasubramaniam, R. (2018). A New Paradigm in Earth Environmental Monitoring with the CYGNSS Small Satellite Constellation. *Scientific reports*, 8(1), 8782.

Ruf, C., R. Balasubramaniam, "Development of the CYGNSS Geophysical Model Function for Wind Speed," *IEEE J. Sel. Topics Appl. Earth Obs. Remote Sens.*, doi: 10.1109/JSTARS.2018.2833075, 2018.

Ruf, C., S. Gleason, D. S. McKague, "Assessment of CYGNSS Wind Speed Retrieval Uncertainty," *IEEE J. Sel. Topics Appl. Earth Obs. Remote Sens.*, doi: 10.1109/JSTARS.2018.2825948, 2018.

Southwell, B. J., A. G. Dempster, "A New Approach to Determine the Specular Point of Forward Reflected GNSS Signals," *IEEE J. Sel. Topics Appl. Earth Obs. Remote Sens.*, doi: 10.1109/JSTARS.2017.2775647, 11(2), 2018.

Wang, T., C. S. Ruf, B. Block, D. S. McKague, S. Gleason, "Design and Performance of a GPS Constellation Power Monitor System for Improved CYGNSS L1B Calibration," *IEEE J. Sel. Topics Appl. Earth Obs. Remote Sens.*, doi: 10.1109/JSTARS.2018.2867773, 2018.

## 2017

Anguelova, M. D., and P. Huq. (2017) Effects of Salinity on Surface Lifetime of Large Individual Bubbles, *J. Mar. Sci. Eng.*, 5(3), 41, doi:10.3390/jmse5030041, Publication Date: 1 September 2017.

Anguelova, M. D., and P. Huq (2017) Effects of Salinity on Surface Lifetime of Large Individual Bubbles. *J. Mar. Sci. Eng.*, 5(3), 41, doi:10.3390/jmse5030041.

Clarizia, M., and C. Ruf, "Bayesian Wind Speed Estimation Conditioned on Significant Wave Height for GNSS-R Ocean Observations," *J. Atmos. Oceanic Techn.*, doi:10.1175/JTECH-D-16-0196.1, 34(6), 1193-1202, 2017.

Crespo, J. A., D. J. Posselt, C. M. Naud, and C. Bussy-Virat, 2017: CYGNSS Observations of Extratropical Fronts and Cyclones. *J. Appl. Meteor. Clim.*, 56, 2027-2034.

Fan, Y., and P. Hwang, 2017: Kinetic energy flux budget across air-sea interface. *Ocean Modeling*, 120, 27-40.

Hwang, P. A., and Y. Fan, 2017: Effective fetch and duration of tropical cyclone wind fields estimated from simultaneous wind and wave measurements: Surface wave and air-sea exchange computation. *Journal of Physical Oceanography*, 47, 447-470.

Hwang, P. A., X. Li, and B. Zhang, 2017: Retrieving hurricane wind speed from dominant wave parameters. *IEEE J-STARS*, 10 (6), 2589-2598.

Hwang, P. A., Y. Fan, F. J. Ocampo-Torres, and H. García-Nava, 2017: Ocean surface wave spectra inside tropical cyclones. *J. Phys. Oceanogr.*, 47, 2293-2417.

Park, J., J. T. Johnson, “A Study of Wind Direction Effects on Sea Surface Specular Scattering for GNSS-R Applications,” *IEEE J. Sel. Topics Appl. Earth Obs. Remote Sens.*, doi: 10.1109/JSTARS.2017.2719405, 10(11), 2017.

Ling, J., C. Li, T. Li, X. Jia, B. Khouider, E. Maloney, F. Vitart, and C. Zhang, 2017: Meeting Summary: Challenges and opportunities of MJO study. *Bull. Amer. Meteor. Soc.*, **98**, ES53-56.  
Zhang, L., W. Han, Y. Li, E. D. Maloney, 2018: Role of north Indian Ocean air-sea interaction in summer monsoon intraseasonal oscillation. *J. Climate*, 31, 7885-7908.

Morris, M., and C. S. Ruf, 2017a: Estimating Tropical Cyclone Integrated Kinetic Energy with the CYGNSS Satellite Constellation. *J. Appl. Meteor. Climatol.*, 56, 235–245, doi: 10.1175/JAMC-D16-0176.1.

Morris, M., and C. S. Ruf, 2017b, Determining Tropical Cyclone Surface Wind Speed Structure and Intensity with the CYGNSS Satellite Constellation, *J. Appl. Meteor. Climatol.*, 56(7), 1847–1865, doi: 10.1175/JAMC-D-16-0375.1.

Riley Dellaripa, E., E. Maloney, and S. van den Heever, 2017: Wind-flux feedbacks and convective organization during the November 2011 MJO event in a high resolution model. *J. Atmos. Sci.*, **75**, 57-84.

Zhang, S., Z. Pu, D. J. Posselt, and R. Atlas. 2017: Impact of CYGNSS ocean surface wind speeds on numerical simulations of a hurricane in observing system simulation experiments. *Journal of Atmospheric and Oceanic Technology*, **34**, 375-383. <http://dx.doi.org/10.1175/JTECH-D-16-0144.1>

## 2016

Allen, T., B.E. Mapes, and N. Cavanaugh, 2016: Informativeness of wind data in linear Madden-Julian oscillation prediction. *Atm. Sci. Lett*, doi:10.1002/asl.666/full

Chen-Zhang, D. D., C. S. Ruf, F. Ardhuin, and J. Park, “GNSS-R nonlocal sea state dependencies: Model and empirical verification,” *J. Geophys. Res. Oceans*, 121, doi: 10.1002/2016JC012308, 2016.

Chen, D. D., C. S. Ruf and S. T. Gleason, “Response time of mean square slope to wind forcing: An empirical investigation,” *J. Geophys. Res. Oceans*, doi:10.1002/2016JC011661, 2016.

Clarizia, M. P., and C. S. Ruf, “On the Spatial Resolution of GNSS-Reflectometry,” *IEEE Geosci. Remote Sens. Ltrs.*, doi:10.1109/LGRS.2016.2565380, 2016.

Clarizia, M. P., and C. S. Ruf, “Wind Speed Retrieval Algorithm for the Cyclone Global Navigation Satellite System (CYGNSS) Mission,” *IEEE Trans Geosci. Remote Sens.*, 54(8), doi:10.1109/TGRS.2016.2541343, Aug. 2016.

Clarizia, M.P., C. Ruf, P. Cipollini and C. Zuffada, "First Spaceborne Observation of Sea Surface Height Using GPS Reflectometry," *Geophys. Res. Lett.*, 43, doi:10.1002/2015GL066624, 2016.

Giangregorio, G., M. di Bisceglie, P. Addabbo, T. Beltramonte, S. D'Addio and C. Galdi, "Stochastic Modeling and Simulation of Delay–Doppler Maps in GNSS-R Over the Ocean," in *IEEE Transactions on Geoscience and Remote Sensing*, vol. 54, no. 4, pp. 2056-2069, April 2016.

Gleason, S., C. Ruf, M. P. Clarizia, A. O'Brien, "Calibration and Unwrapping of the Normalized Scattering Cross Section for the Cyclone Global Navigation Satellite System (CYGNSS)," *IEEE Trans. Geosci. Remote Sens.*, 54(5), 2495-2509, doi:10.1109/TGRS.2015.2502245, 2016.

Hoover, K., 2016: Evaluation of CYGNSS in Understanding the Convective Winds in the Weak December 2011 MJO Event Captured by the DYNAMO Field Experiment. Master's Thesis, University of Alabama in Huntsville, 116pp.

Ruf, C. S., R. Atlas, P. S. Chang, M. P. Clarizia, J. L. Garrison, S. Gleason, S. J. Katzberg, Z. Jelenak, J. T. Johnson, S. J. Majumdar, A. O'Brien, D. J. Posselt, A. J. Ridley, R. J. Rose, V. U. Zavorotny, "New Ocean Winds Satellite Mission to Probe Hurricanes and Tropical Convection," *Bull. Amer. Meteor. Soc.*, doi:10.1175/BAMS-D-14-00218.1, pp385-395, Mar 2016.

## 2015

Hannah, W. M., B. E. Mapes, and G. S. Elsaesser 2015: A Lagrangian View of Moisture Dynamics During DYNAMO. *J. Atmos. Sci.*, <http://journals.ametsoc.org/doi/abs/10.1175/JAS-D-15-0243.1>

Hannah, W. M., B. E. Mapes, and G. S. Elsaesser 2015: A Lagrangian View of Moisture Dynamics During DYNAMO. *J. Atmos. Sci.*, <http://journals.ametsoc.org/doi/abs/10.1175/JAS-D-15-0243.1>

Riley Dellaripa, E. M., and E. D. Maloney, 2015: Analysis of MJO wind-flux feedbacks in the Indian Ocean using RAMA buoy observations. *J. Meteor. Soc. Japan*, <http://dx.doi.org/10.2151/jmsj.2015-021>.

## Proceedings Publications

### 2019

Balasubramaniam, R., C. Ruf, "The Impact Of Rain On L1 GNSS-R Radar Scattering Cross-Section," Proc. 2019 International Geoscience and Remote Sensing Symposium, Yokohama, JAPAN, doi 10.1109/IGARSS.2019.8900302:, July 2019.

Cardellach, E., W. Li, A. Rius, M. Semmling, J. Wickert, F. Zus, C. Ruf, "First Precise Spaceborne Sea Surface Altimetry With GNSS Reflected Signals First Evidences of Spaceborne Carrier Phase Altimetry Using GNSS Reflected Signals at Grazing Angles of Observation Over Open Sea Water," Proc. 2019 International Geoscience and Remote Sensing Symposium, Yokohama, JAPAN, July 2019.

Ethan Kubatko, "High-Order Discontinuous Galerkin Methods for Coastal Hydrodynamics Applications," 2019 SIAM Conference on Mathematical & Computational Issues in the Geosciences, March 11-14, 2019, Houston, TX (accepted).

M. di Bisceglie, C. Galdi and G. Giangregorio, "Sensitivity of Delay-Doppler Maps to Wind Direction with a Deconvolution Approach," IGARSS 2019 - 2019 IEEE International Geoscience and Remote Sensing Symposium, Yokohama, July 2019.

Younghun Kang and Ethan Kubatko, "Effects of CYGNSS-derived parametric wind fields on storm surge modeling," Finite Elements in Fluids, March 31-April 3, 2019, Chicago, IL,

Li, X., et al., 2019: Assimilation of CYGNSS Wind Data for Improving Tropical Convection Forecasts. 99th Annual Meeting, American Meteorological Society, Phoenix, AZ.

Mayers, D., C. Ruf, "Determining Tropical Cyclone Center Location with CYGNSS Wind Speed Measurements," Proc. 2019 International Geoscience and Remote Sensing Symposium, Yokohama, JAPAN, doi: 10.1109/IGARSS.2019.8900346, July 2019.

McKague, D., C. Ruf, "On-Orbit Trending of CYGNSS Data," Proc. 2019 International Geoscience and Remote Sensing Symposium, Yokohama, JAPAN, doi: 10.1109/IGARSS.2019.8898395 , July 2019.

Roberts, J. B., and T. J. Lang, 2019: Use of Kalman Filtering to Improve CYNSS Air-Sea Interaction Applications. 99th Annual Meeting, American Meteorological Society, Phoenix, AZ.

Ruf, C., D. McKague, M. Morris, D. Posselt, M. Moghaddam, "The GNSS-R CYGNSS Mission: An Update," Proc. 2019 International Geoscience and Remote Sensing Symposium, Yokohama, JAPAN, doi: 10.1109/IGARSS.2019.8900604, July 2019.

Ruf, C., D. McKague, S. Gleason, “CYGNSS SmallSat Mission Design, Engineering Performance and Science Results,” Proc. 2019 International Geoscience and Remote Sensing Symposium, Yokohama, JAPAN, doi: 10.1109/IGARSS.2019.8900271, July 2019.

Ruf, C., C. Chew, Z. Pu, A. Warnock, “CYGNSS Constellation of GNSS-R SmallSats,” European Space Agency 6th Wkshp on Advanced RF Sensors and Remote Sens. Instr. (ARSI'19), Noordwijk, The Netherlands, Nov 2019.

Ruf, C., “Assimilation of TC Inner Core Surface Winds by CYGNSS into Forecast Models,” Proc. Asia Oceania Geosciences Society 16th Annual Meeting, Singapore, July 2019.

Wang, T., C. Ruf, S. Gleason, B. Block, D. McKague, A. O'Brien, “A Real-Time EIRP Level 1 Calibration Algorithm for the CYGNSS Mission Using the Zenith Measurements,” Proc. 2019 International Geoscience and Remote Sensing Symposium, Yokohama, JAPAN, doi: 10.1109/IGARSS.2019.8900456, July 2019.

## 2018

Burrage, D. M., M. D. Angulelova, D. W. Wang, J. C. Wesson (2018) Predicting L-Band Emissivity of a Wind-Roughened Sea with Foam Layers or Whitecaps and Overlying Spray, Using a Finite-Difference Time-Domain Model. Proc. 16th. Specialist Meeting on Microwave Radiometry and Remote Sensing of the Environment, March 27-30, MicroRad 2018, Boston, MA. (IEEE Explore, Microrad 2018 Proceedings, pp. 24-29).

Zhang, H., J. L. Garrison, D. M. Burrage (2018) Ocean roughness and wind measurements with L- and S-band signals of opportunity (SOOP) reflectometry, IGARSS 2018, 23-27 July, Valencia, Spain, (Extended abstract).

*Revisiting assumptions: a critical re-examination of ocean surface wind assimilation in the U.S. Navy's Global and Mesoscale Data Assimilation System.* Nancy Baker, Liang Xu, Justin Tsu. Workshop on Sensitivity Analysis and Data Assimilation in Meteorology and Oceanography 1-6 July 2018, Meliá Ria HotelAveiro, Portugal.

P. Addabbo, M. di Bisceglie, C. Galdi and G. Giangregorio, “An Algorithm for Wind Speed Retrieval from CYGNSS Space Observatories,” IGARSS 2018 - 2018 IEEE International Geoscience and Remote Sensing Symposium, Valencia, 2018, pp. 4281-4284.

Anguelova, M. D., M. H. Bettenhausen (2018) Effect of a sea spray layer on ocean surface signal at GPS frequencies, AMS 21st ASI Conference, 11-15 June, Oklahoma City, OK (Poster Presentation).

Anguelova, M. D., M. H. Bettenhausen (2018) Electromagnetic Properties of a Sea Spray Layer Under High Winds, AGU Ocean Sciences Meeting, 11–16 February, Portland, OR (Oral Presentation).



Anguelova, M. D., M. H. Bettenhausen (2018) Effect of a Sea Spray Layer on Remote Sensing of Ocean Surface. SOLAS Ocean Remote Sensing Workshop, March 13–15, Potomac, MD (Oral Presentation).

Balasubramaniam, R., C. S. Ruf, “Improved Calibration of CYGNSS Measurements for Downbursts in the Intertropical Convergence Zone,” Proc. 2018 International Geoscience and Remote Sensing Symposium, Valencia, SPAIN, doi: 10.1109/IGARSS.2018.8517571, pp. 3987-3990, July 2018.

Burrage, D. M., M. D. Anguelova, D. W. Wang and J. C. Wesson (2018) Predicting L-band Emissivity of a Wind-roughened Sea with Foam Layers or Whitecaps and Overlying Spray, Using a Finite-Difference Time-Domain Model. MicroRad 2018 27-30 Mar, Cambridge, MA, (Poster Presentation).

Crespo, J. A., and D. J. Posselt, CYGNSS Observations of Low-Latitude Extratropical Cyclones and Estimates of Surface Heat Fluxes. Talk presented in the 22nd Conference on Satellite Meteorology and Oceanography at the 98th American Meteorological Society Annual Meeting, Austin, TX, 7-11 January 2018.

Cui, Z., Z. Pu, V. Tallapragada, C. Ruf, R. Atlas, 2018: Assimilation of CYGNSS ocean surface winds with NCEP HWRf model GSI-based ensemble-variational data assimilation systems for improved numerical simulations of tropical cyclones and tropical convection. *33<sup>rd</sup> Conference on Hurricane and Tropical Meteorology*. 16-20 April 2018, Ponte Vedra, FL.

Killough, R., J. Scherrer, R. Rose, A. Brody, J. Redfern, K. Smith, C. S. Ruf, T. Yee, “CYGNSS Launch and Early Ops: Parenting Octuplets,” Proc. 31st Annual AIAA/USU Conference on Small Satellites, Year in Review, SSC17-X-01, <http://digitalcommons.usu.edu/smallsat/2017/all2017/136/>.

Ethan Kubatko, "Effects of CYGNSS-derived parametric wind fields on storm surge modeling," CYGNSS Science Team Meeting, June 18-20, 2018

Lang, T. J., et al., 2018: Examining tropical oceanic convection using IMERG and CYGNSS. NASA Precipitation Measurement Missions Science Team Meeting, NASA, Phoenix, AZ.

Lang, T. J., P. Garg, G. Priftis, S. Nesbitt, T. Chronis, and R. Lindsley, 2018: Examining convective signatures in scatterometer data. 2018 International Ocean Vector Winds Science Team Meeting, NASA, Barcelona, Spain.

Li, W., Cardellach, E., Fabra, F., Ribó, S., Rius, A., Altimetry over Sea Ice Using Coherent GNSS Reflections, International Geoscience and Remote Sensing Symposium (IGARSS) 2018, Valencia (it included two slides showing Lake Qinghai preliminary results)

Xiaowen Li, Stephen Nicholls, Takaa Iguchi and Wei-Kuo Tao, 2018: “Coupled regional model simulation of DYNAMO MJO: Comparisons between the Indian Ocean and Maritime

Continent". 33<sup>rd</sup> Conference on Hurricanes and Tropical Meteorology, April 16-20, Ponte Vedra Beach, FL.

Li, X., T. Lang, and J. Mecikalski, 2018: Analysis and Assimilation of CYGNSS Wind Data for Improved Tropical Convection Forecasts. 98th Annual Meeting, American Meteorological Society, Austin, TX.

Liu, W.T., and X. Xie, 2018: Non-sun-synchronous ocean surface wind measurement under heavy rain. IGARSS 2018 Meeting in Valencia, Spain.

Mayers, D., C. S. Ruf, "Measuring Ice Thickness with CYGNSS Altimetry," Proc. 2018 International Geoscience and Remote Sensing Symposium, Valencia, SPAIN, doi: 10.1109/IGARSS.2018.8519310, pp. 8535-8538, July 2018.

Norris, R., C. Ruf, E. Loria, A. O'Brien, "Comparison of Wide Bandwidth Conventional and Interferometric GNSS-R Techniques for Possible CYGNSS Follow-On Mission," Proc. 2018 International Geoscience and Remote Sensing Symposium, Valencia, SPAIN, doi: 10.1109/IGARSS.2018.8517480, pp. 4277-4280, July 2018.

Morris, M., D. Mayers, C.S. Ruf, 2018: Early Evaluation of On-Orbit CYGNSS Level 4 Tropical Cyclone Science Data Products. American Meteorological Society Annual Meeting, Austin, TX.

Natoli, M., and E. D. Maloney, 2018: Intraseasonal Variability in the Diurnal Cycle of Precipitation in the South China Sea and Maritime Continent. *33rd AMS Conference on Hurricanes and Tropical Meteorology*, 15-20 April, 2018, Ponte Vedra, Florida.

Posselt, D. J., C. S. Ruf, R. Atlas, N. L. Baker, D. Burrage, J. A. Crespo, J. T. Johnson, T. J. Lang, X. Li, E. D. Maloney, D. McKague, M. Morris, Z. Pu, E. Riley Dellaripa, and D. E. Waliser, 2018: CYGNSS Science Highlights from the First Year on Orbit at *2018 AMS Annual Meeting*, 6-11 January, 2018, Austin, Texas.

Pu, Z., Z. Cui, V. Tallapragada, C. Ruf, R. Atlas, 2018: Assimilation of CYGNSS ocean surface winds with NCEP GSI-based ensemble-variational data assimilation systems. *22<sup>nd</sup> Conference on Satellite Meteorology and Oceanography*, 98<sup>th</sup> AMS annual meeting, 7-11 January 2018, Austin, TX.

Pu, Z., Z. Cui, S. Zhang, C. Yu, 2018: Enhancing tropical cyclone prediction with advanced assimilation of GPM and CYGNSS satellite observations. *15th Annual Meeting Asia Oceania Geosciences Society. June 03-08, 2018, Hawaii, USA. (Invited Talk)*

Pu, Z., Z. Cui, V. Tallapragada, W. McCarty, R. Atlas, 2018: Assimilation of CYGNSS and GPM Satellite Data in Improving Hurricane Forecasting. *16<sup>th</sup> JCSDA Science and Technical Workshop*. May 30- June 1, 2018, Boulder, CO.

Pu, Z., Z. Cui, V. Talapragada, C. Ruf, R. Atlas, 2018: Assimilation of CYGNSS ocean surface winds with NCEP HWRf model GSI-based ensemble-variational data assimilation systems. *CYGNSS Science Team Meeting*, June 18-20, 2018, Ann Arbor, MI

Riley Dellaripa, E. M., E. D. Maloney, S. M. Saleeby, and B. A. Toms, 2018: The Importance of Topography to the Luzon Diurnal Cycle During a BSISO Event. *33rd AMS Conference on Hurricanes and Tropical Meteorology*, 15-20 April, 2018, Ponte Vedra, Florida.

Ruf, C., C. Bussy-Virat, D. McKague, A. Ridley, M. Morris, "Enabling Sampling Properties of the CYGNSS Satellite Constellation," Proc. 2018 International Geoscience and Remote Sensing Symposium, Valencia, SPAIN, doi: 10.1109/IGARSS.2018.8518454, pp. 277-280, July 2018.

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*A NAVGEM Data Assimilation Study Using Comparative ASCAT Experiments.* Baker, Swadley, Tsu. AMS 97<sup>th</sup> Annual Meeting in Seattle, WA. 2017 January. 21<sup>st</sup> Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface.

P. Addabbo, M. di Bisceglie, C. Galdi and G. Giangregorio, "Performance of the Delay-Doppler Scattered Power Volume Observable for Wind Speed Estimation with CYGNSS," GNSS+R 2017, Specialist Meeting on Reflectometry using GNSS and other Signals of Opportunity, May 23-25, 2017, Ann Arbor, MI USA.

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Lang, T. J., et al., 2017: Using CYGNSS to Observe Convectively Driven Near-Surface Winds in Tropical Precipitation Systems during Madden-Julian Oscillation Events. 97<sup>th</sup> Annual Meeting, American Meteorological Society, Seattle, WA.

Lang, T. J., et al., 2017: Using CYGNSS to investigate relationships between wind-driven surface fluxes and tropical oceanic convection. GNSS+R 2017 Workshop, University of Michigan, Ann Arbor, MI.

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Liu, W.T. and X.Xie, 2017: CYGNSS unveils monsoon convection. Oceanography Seminar at Jet Propulsion Laboratory, Pasadena.

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S. Principe, T. Beltramonte, M. di Bisceglie and C. Galdi, “Statistical Modeling and Simulation of Delay-Doppler Maps in the Time-Varying Regime,” 2017 IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Fort Worth, TX, 2017, pp. 4121-4124.

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- Pu, Z. 2017, The impact of CYGNSS Ocean Surface Winds on Numerical Prediction of Tropical Convection and Hurricanes with NCEP GSI-based ensemble-variational data assimilation system. *GNSS+R 2017*, 23-25 May 2017, Ann Arbor, MI.
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- Schreck, C. J.: Kelvin waves and Subseasonal Hurricane Activity. National Hurricane Center. 19 December 2017, Miami, FL.
- Schreck, C. J.: Interactions between Kelvin waves and easterly waves in CYGNSS. *CYGNSS Science Team Meeting*. 18-19 December 2017, Miami, FL.
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- Zhang, H., Garrison, J. L., and Warnecke, J. G. (2017) Development of a Geophysical Model Function for Remote Sensing of High Ocean Surface Winds using S-band Reflectometry, GNSS+R 2017 Specialist Meeting on Reflectometry using GNSS and other Signals of Opportunity, Ann Arbor, MI, USA, May (Oral Presentation).
- Zhang, H., Garrison, J. L., and Burrage, D. M. (2017), Ocean Roughness Retrievals Using Dual-pol Reflectometry in S and L-Band, GNSS+R 2017 Specialist Meeting on Reflectometry using GNSS and other Signals of Opportunity, Ann Arbor, MI, USA, May (Poster Presentation).

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*Comparative Impact of Ocean Surface Wind Vectors and Ocean Surface Wind Speed for Global NWP.* Baker, Swadley, Tsu. 13<sup>th</sup> International Winds Working Group Meeting. 2016 June

*A NAVGEM Data Assimilation Study Using Comparative ASCAT Experiments.* Baker, Swadley, Tsu. AMS 20th Conference on Air-Sea Interaction. 2016 August.

Anguelova, M. D., D. Burrage, M. H. Bettenhausen Reflectivity and emissivity of sea foam at L-band. MicroRad 2016, 11-14 April, Espoo, Finland (Poster Presentation).

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Morris, M., and C. S. Ruf, 2016: A CYGNSS Tropical Cyclone Integrated Kinetic Energy (IKE) Science Data Product. American Meteorological Society, 32nd Conference on Hurricane and Tropical Meteorology, San Juan, PR. (talk)

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Morris, M., D. Posselt, and C. S. Ruf, 2016: Estimating Tropical Cyclone Surface Wind Field Parameters with the CYGNSS Constellation. American Geophysical Union Fall Meeting, San Francisco, CA. (poster)

Morris, M., D. D. Chen and C. S. Ruf, "Earth antenna temperature variability for CYGNSS," Proc. 2016 International Geoscience and Remote Sensing Symposium, Beijing, CHINA, doi: 10.1109/IGARSS.2016.7729214, pp. 846 - 849, July 2016.

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Clarizia, M.-P., C.S. Ruf, P. Braca, P. Willet, "Target Detection Using GPS Signals of Opportunity," 18th Intl. Conf. Information on Fusion, Washington DC, 6-9 July 2015.

Fritz, M., J. Shoer, L. Singh, T. Henderson, J. McGee, R. Rose, C. Ruf, "Attitude Determination and Control System Design for the CYGNSS MicroSatellite," Proc. 2015 IEEE Aerospace Conf., Big Sky, MT, 7-14 Mar 2015.

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Liu W.T. and W. Tang, 2015: Measuring surface stress in tropical cyclone – potential synergism of ASCAT and CYGNSS. Ocean Vector Wind Science Team Meeting, Portland, OR.

Liu, W.T., W. Tang, and X. Xie, 2015: Diurnal cycle of ocean vector wind observed from non-sun-synchronous orbits. CYGNSS Science Team Meeting in Jacksonville, FL

Maloney, E. D., and B. O. Wolding, 2015: Diagnosing MJO Destabilization and Propagation with the Moisture and MSE Budgets. Abstract EGU2015-8472 presented at the *2015 EGU General Assembly*, 12-17 April, 2015, Vienna, Austria.

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Rose, R., C. Ruf, J. Scherrer, J. Wells, “The CYGNSS Flight Segment; Mainstream Science on a Micro-Budget,” Proc. 2015 IEEE Aerospace Conf., Big Sky, MT, 7-14 Mar 2015.

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Lang, T. J., et al., 2014: Exploring the utility of the planned CYGNSS mission for investigating the initiation and development of the Madden-Julian Oscillation. 31<sup>st</sup> Conference on Hurricanes and Tropical Meteorology, American Meteorological Society, San Diego, CA.

Miller, S.A., R.L. Killough, S.W. Cook, and C. Ruf., “Onboard Science Processing on a Microsatellite with Limited Resources,” Proc. 2014 IEEE Aerospace Conf., Big Sky, MT, Mar 2014.

Pu, Z., 2014: The impact of CYGNSS surface wind observations and 3-D winds on high-impact weather forecasting. *CYGNSS Science Team Meeting*, San Diego, March 30, 2014

Riley, E. M., and E. D. Maloney, 2014: Analysis of the MJO-wind speed relationship in the Indian Ocean using observations and models. *Papers, 31st AMS Conference on Hurricanes and Tropical Meteorology*, March 30-April 4, 2014, San Diego, California.  
*NCAR ASP Seminar*, May 14, 2014, Title: The Madden-Julian Oscillation: Theory, Modeling, and Impacts. Boulder, CO (invited).

Riley, E. M., and E. D. Maloney, 2014: Analysis of MJO Wind-Flux Feedbacks in the Indian Ocean Using Observations. Abstract A51L-07 presented at *2014 AGU Fall Meeting*, 15-19 December, 2014, San Francisco, California.

Rose, R., S. Gleason, C. Ruf, “The NASA CYGNSS mission: a pathfinder for GNSS scatterometry remote sensing applications”, Proc. SPIE, Bellingham, WA, Vol. 9240, 924005, doi:10.1117/12.2068378, 2014.

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Clarizia, M. P., C. Gommenginger, P. Jales, M. Unwin, C. Robertson, Z. Jelenak and C. Ruf, “Delay-Doppler Processing and Analysis of the UK-DMC GPS-Reflectometry Dataset: Results from the Wavesentry Project,” Proc. ESA Living Planet Symp., Edinburgh, UK, Sep. 2013.

Dickinson, J. R., J. L. Alvarez, R. J. Rose, C. S. Ruf, B. J. Walls, "Avionics of the Cyclone Global Navigation Satellite System (CYGNSS) Microsat Constellation," Proc. 2013 IEEE Aerospace Conf., Big Sky, MT, 2-9 Mar 2013.

Finley, T., D. Rose, K. Nave, W. Wells, J. Redfern, R. Rose and C. Ruf, "Techniques for LEO Constellation Deployment and Phasing Utilizing Differential Aerodynamic Drag," Proc. AAS/AIAA Astrodynamics Specialist Conf., v150, pp1397-1411, ISBN: 978-087703605-0, Hilton Head, SC, Aug 2013.

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Chen, D. D., S. Gleason, C. Ruf and M. Adjrard, "Spectral Dependence of the Response Time of Sea State to Local Wind Forcing," Proc. 2012 International Geoscience and Remote Sensing Symposium, Munich, GERMANY, pp. 3776-3779, 23-27 July 2012.

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## Non-refereed Publications

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Meissner, T., L. Ricciardulli, J. Hawkins, M. Kucas, M. Morris, A. Mouche, N. Reul, K. Wood, 2018: INTERNATIONAL WORKSHOP on TROPICAL CYCLONES (IWTC-9) Report: TC Analysis and Remote Sensing: New and Existing Methods to Estimate TC Surface Wind Structure. pp 25, [https://www.wmo.int/pages/prog/arep/wwrp/tmr/documents/IWTC-9\\_Subtopic\\_5-1.pdf](https://www.wmo.int/pages/prog/arep/wwrp/tmr/documents/IWTC-9_Subtopic_5-1.pdf)

Posselt, D., C. Ruf, "Summary of the Eighth CYGNSS Science Team Meeting," The Earth Observer, NASA, 30(2), 20-22, Mar-Apr 2018.

### 2017

Pu, Z., L. Zhang, S. Zhang, B. Gentry, D. Emmitt, B. Demoz, R. Atlas, 2017: The impact of Doppler wind lidar measurements on high-impact weather forecasting: Regional OSSE and data assimilation studies. **Book Chapter**, "*Data Assimilation for Atmospheric, Oceanic and Hydrologic Applications (Vol. III)*", Ed. By S. K. Park and L. Xu, Springer, pp.259-283. DOI 10.1007/978-3-319-43415-5\_12.

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Marsik, F., C. Ruf, A. Lyons, P. Chang, Z. Jelenak, H. Hanson, "Eight Microsatellites, One Mission: CYGNSS," The Earth Observer, NASA, 28(6), 4-13, Nov-Dec 2016.

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Murray, J. J., Ruf, C., Baker, N., Lang, T., Uhlhorn, E., Masters, D., Halliwell, G., Carey, K., Helms, D., Escobar, V., McCarty, W., Green D. S., Stough, T., and Molthan, A.. Report on the NASA CYGNSS Mission Applications Workshop, NASA-CP-2015-218993, NASA Publ., 56 pp., 2016.

### 2015

Castillo, T., 2015: Understanding How CYGNSS Will Depict Convective Variability by Ingesting a High Temporal Resolution WRF Simulation into the CYGNSS End-To-End Simulator. Master's Thesis, University of Alabama in Huntsville, 109pp.

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Ruf, C., M. Unwin, J. Dickinson, R. Rose, D. Rose, M. Vincent and A. Lyons, "CYGNSS: Enabling the Future of Hurricane Prediction," IEEE Geosci. Remote Sens. Mag., 1(2), 52-67, doi: 10.1109/MGRS.2013.2260911, 2013.

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