

# Y. T. Jade Morton

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## CAREER SUMMARY

Dr. Jade Morton is a professor, Thomas Austin Faculty Fellow, the Director for Colorado Center for Astrodynamics Research (CCAR), and the head of the Satellite Navigation and Sensing (SeNSE) Laboratory in the Aerospace Engineering Sciences Department at the University of Colorado (CU), Boulder. Prior to joining CU in 2017, she was an electrical engineering professor at Colorado State University and at Miami University where she led the creation of the Electrical and Computer Engineering Department. Dr. Morton's research interests lie at the intersection of satellite navigation technologies and remote sensing of the Earth's space environment, atmosphere, and surface. She is an author of over 290 technical publications and the lead editor of a two-volume set on position, navigation, and timing technologies under production to be published by Wiley-IEEE Press in August 2020. She has lead and participated in more than 40 projects sponsored by AFOSR, AFRL, ARMY, DARPA, DHS, NASA, NOAA, NSF, ONR, Lockheed Martin, Septentrio, etc.. She has advised and mentored more than 40 graduate students and post-docs, delivered nearly 50 short courses and tutorials for government labs, industry partners, and at professional conferences and workshops. She has provided numerous services to the navigation and the space science research communities, including being the Technical Editor of Navigation Systems for IEEE Transactions on Aerospace and Electronics Systems, an editor for Beidou Special Issue for Navigation, Journal of Institute of Navigation (ION), President of the ION, Program Chair and General Chair of numerous international conferences, and a founding member of the Consortium of Ohio Universities on Navigation and Timekeeping (COUNT). She is a distinguished lecturer of the IEEE Aerospace and Electronics Systems Society and a recipient of the ION Burka, Thurlow, and Kepler award, and the IEEE PLANS Richard Kershner award. Dr. Morton is a fellow of IEEE, ION, and the Royal Institute of Navigation (RIN).

## EDUCATION

Ph.D. (1991), Electrical Engineering, the Pennsylvania State University, University Park, PA  
M.S. (1987), Electrical Engineering, Case Western Reserve University, Cleveland, OH  
B.S. (1983), Physics, Nanjing University, Nanjing, China

## PROFESSIONAL POSITIONS

University of Colorado, Boulder, CO, Smead Aerospace Engineering Sciences Department  
Professor, Thomas F. Austin Faculty Fellow (2017 – Present)  
Director, Colorado Center for Astrodynamics (CCAR) (2019 – Present)  
Associate Chair for Graduate Programs (2018 – 2019)  
Colorado State University, Fort Collins, CO, Electrical & Computer Engineering Department  
Professor (2014 – 2017)  
Miami University, Oxford, OH, Electrical & Computer Engineering Department  
Professor (2009 – 2014), Associate Professor (2006 – 2009), Assistant Professor (2000 – 2006)  
The University of Michigan, Ann Arbor, MI  
Post-Doctoral Research Fellow (1991-1993), Space Physics Research Laboratories  
The Pennsylvania State University, University Park, PA  
Research Assistant (1987-1991), Electrical & Computer Engineering Department

Case Western Reserve University, Cleveland, OH  
Research Assistant (1986-1987), Electrical Engineering & Applied Physics Department  
Nanjing University, Nanjing, China  
Faculty (1983-1985), Physics Department

## PROFESSIONAL LEADERSHIP POSITIONS and SERVICES

- Affiliations and Membership
  - American Geophysical Union (AGU)
  - Institute of Electrical and Electronics Engineering (IEEE), Fellow (2014)
    - \* IEEE Aerospace and Electronic Systems Society
    - \* IEEE Geoscience and Remote Sensing
    - \* IEEE Signal Processing
    - \* IEEE Women in Engineering Society
  - Institute of Navigation (ION), Fellow (2015)
  - International Union of Radio Science (URSI)
  - Royal Institute of Navigation, Fellow (2019)
- Offices/Positions Held
  - ION President (2019-21)
  - ION Pacific Rim Collaboration Liaison (2014-20)
  - ION Executive Vice President (2017-19)
  - ION Award Committee Member (2017-19)
  - ION Satellite Division Executive Committee (2010-16)
  - Chair, ION GNSS+ Student Paper Award Committee (2014-16)
  - Chair, ION Satellite Division (2012-14)
  - Technical Committee Member, IEEE MTT Soc., Digital Signal Proc. Subgroup (2004-14)
  - Vice Chair, ION Satellite Division (2010-12)
  - Eastern Region Member-at-Large, ION (2012, 2009)
  - President, Chinese Professional in Global Positioning Systems (2010)
  - Chair, ION Outreach (2010-12)
  - Chair, Brad Parkinson Thesis Award Committee, ION (2008)
  - Chair, Award Committee, New Navigation Tech.& Innovations Conf., Beijing, China (2008)
  - Member, ION Council (since 2006)
  - Chair, ION Dayton Section (2006-7)
- Advisory Board Member Service
  - Highly Automated Transportation Systems Research, a DOT University Transportation Center operated by a consortium comprising the Ohio State University, University of California Irvine, University of Texas Austin, and University of Cincinnati (2020-2022).
  - High Frequency Active Auroral Research Program, Alaska (2020-present)
  - Jicamarca Radio Observatory, Peru (2018-present)
  - Navmatic, US (2020-present)
- Conference Organization
  - General Chair, ION Pacific Position, Navigation, & Timing Conf., 2019
  - Session Co-Chair, USNC-URSI National Radio Science Meeting, 2019, 2021
  - Session Co-Chair, Coupling, Energetics, & Dynamics of Atmospheric Regions (CEDAR) Workshop, 2018, 2019
  - Session Co-Chair, ION International Technical Meeting, 2008, 2009, 2010, 2012, 2013, 2019
  - Session Co-Chair, URSI Atlantic Radio Science Meeting, 2018
  - Session Co-Chair, AGU Meeting, 2018
  - Program Co-Chair, ION Pacific Position, Navigation, & Timing Conf., 2013, 2015, 2017
  - ION Technical Representative, GNSS+R Workshop, 2017

- Session Co-Chair, ION Global Navigation Satellite Systems+ Conf., 2005, 2009, 2015
- Conference Committee and Navigation Systems Track Chair, IEEE Radar Conf., 2014
- Scientific Committee, Ubiquitous Positioning, Indoor Nav., & Location Based Services, 2014
- General Chair, ION GNSS Conference, 2013
- Program Chair, ION GNSS Conference, 2012
- Section Co-Chair, Chinese Satellite Navigation Conference, 2011, 2012
- General Chair, ION International Technical Meeting, 2012
- Program Committee, Int. Conf. Ubiquitous Pos., Indoor Nav., & Location Based Service, 2012
- Program Chair, ION International Technical Meeting, 2011
- Co-Chair, Compass Workshop at ION GNSS Conference, 2010
- Session Co-Chair, CPGPS International Technical Forum, 2010
- Organizer, Focused Session on Adv. in Positioning Sys., IEEE Int. Microwave Sym., 2009
- Track Chair, ION GNSS Conference, 2007
- Session Co-Chair, ION Annual Meeting, 2003, 2007
- Session Co-Chair, ION National Technical Meeting, 2006, 2007
- Workshop Co-Organizer, IEEE International Microwave Symposium, 2005
- Workshop Organizer, AFOSR Communication & Navigation Program Review, 2005
- Session Co-Chair, IEEE Position, Location, & Navigation System (PLANS) Conf., 2004
- Session Chair, American Control Conference, 2002
- Panel/Working Group Services
  - European Navigation Conference, 2020.
  - Silicon Flatirons Panel on Resilience in Position, Navigation, and Timing, 2020.
  - NASA Space Weather Operation-to-Research Review Panel, 2020.
  - NASA Living With A Star Institute, Working Group 5 Leader, 2018-19.
  - Co-Chair, US-ION Panel, Chinese Satellite Navigation Conf., 2012, 2013, 2014, 2018, 2019.
  - NASA, Space Geodesy Research Review Panel, Washington DC, 2016.
  - NSF, National Center for Atmospheric Research Observing Facilities Review Panel, 2016.
  - NSF, Management and Operations of the Arecibo Observatory Review Panel, 2014.
  - NSF, Coupling, Energetics, & Dynamics of Atmospheric Regions Prog. Review Panel, 2014.
  - White House Office of Science and Technology Policy, Auroral Research Workshop, 2014.
  - National Academies of Science, The Role of High-Power, High Frequency-Band Transmitters in Advancing Ionospheric/Thermospheric Committee Panel, 2013.
  - NSF, ECS – Integrative, Hybrid & Complex Systems Panel, 2005.
- Editorial Services
  - Co-Editor, Special Issue on Beidou Satellite Navigation System, Journal of Navigation, 2019
  - Technical Editor, Navigation Systems, IEEE Trans. Aero. & Elec. Sys., 2014-18
  - Associate Editor, IEEE Trans. Aero. & Elec. Sys., 2008-18
  - Editorial board, Springer journal GPS Solutions, Since 2006
- Journal Review: *EURASIP Journal on Advances in Signal Processing; Geophysical Research Letters; GPS Solutions; Journal of Aircraft; IEEE Communications Letters; IEEE Transactions on Aerospace & Electronics Systems; IEEE Transactions on Signal Processing; IEEE Transactions on Wireless; Journal of Atmospheric and Solar-Terrestrial Physics; Journal of Geophysical Research; Journal of Global Positioning Systems; Navigation, Journal of Institute of Navigation; Radio Science.*
- Book Review:
  - Kaplan, E. and C. Hegarty, Understanding GPS, Principles and Applications, 3<sup>rd</sup> ed., 2017.
  - Betz, J. W., *Engineering Satellite-Based Navigation and Timing: Global Navigation Satellite Systems, Signals, and Receivers*, Wiley-IEEE, 2016.
  - Tsui, J. B. Y., *Global Positioning System Receivers, A Software Approach*, 2<sup>nd</sup> edition, Wiley & Sons, 2004.

- Proposal Review: NSF, AFOSR, AFRL, NASA
- Tutorials and Short Courses Offered to Universities, Industries, and Government Agencies:
  - Consortium of Ohio Universities on Navigation and Timekeeping (COUNT) Short Courses:
    - Advanced GNSS Receivers, Webinar, 2020.
    - Advanced GNSS Receivers, Northrop Grumman, CA, 2019
    - Advanced GNSS Receivers, Dayton, OH, 2018, 2019
    - Ionospheric Scintillation Monitoring Receivers, Dayton, OH, 2016, 2017
    - Ionospheric Scintillation and GNSS Receivers, Dayton, OH, 2015
    - GNSS Remote Sensing, Dayton, OH, 2014
    - GNSS and Space Weather, Dayton, OH, 2013
    - High Sensitivity GNSS, Rockwell Collins, Cedar Rapids, IW, 2012
    - High Sensitivity GNSS Receivers, Dayton, OH, 2012
    - Ionospheric Scintillation, Honeywell, Minneapolis, MN, 2011
    - Ionospheric Scintillation, Dayton, OH, 2011
    - Ionospheric Effects on GNSS, Columbus, OH, 2009, 2010
    - Software Receiver Technologies, Dayton, OH, 2007, 2008
  - Position, Navigation, and Time (PNT) Workshop, South Korea, Seoul, 2016
    - Introduction to GNSS, Part 2: Receiver Processing
    - Ionosphere Effects
    - Remote Sensing Using GNSS Networks
  - Nanyang Technological University, Singapore, 2015
    - Software GNSS Receiver Algorithms
    - Atmospheric Remote Sensing Using GNSS
  - US-Singapore PNT Workshop, Maui, HI, 2014
    - Magnetic Field Modeling
    - Ionosphere Modeling
    - Introduction to Software-Defined Radio
  - Croucher Foundation, Hong Kong
    - Ionosphere Scintillation Monitoring Receivers, 2018
    - GNSS Software Receiver Algorithms and Applications, 2014
  - ION GNSS+ Conference
    - Beidou Navigation Satellite System (co-taught), Miami, FL, 2018
    - High Sensitivity GNSS, Nashville, TN, 2012
    - High Sensitivity GNSS, Portland, OR, 2011
  - IEEE National Aerospace & Electronics Conference
    - High Sensitivity GNSS, Dayton, OH, 2012
    - Software Receivers, Dayton, OH, 2008
  - Polar Aeronomy & Radio Science Workshop, HAARP, AK.
    - Ionospheric Effects on GNSS, 2008, 2009, 2010, 2011, 2012
  - AFOSR Singapore PNT Workshop, Honolulu, HI, 2010
    - GPS 101
    - High Sensitivity GPS
  - African GNSS Outreach Workshop, Trieste, Italy
    - Software-defined GNSS Receivers for Ionospheric Monitoring, 2017
    - Autonomous Vehicle GNC, 2009, 2010
    - Robotics Laboratory, 2009, 2010
  - Space Weather Effects on GNSS Operations at Low Latitudes, Trieste, Italy, 2018
    - GNSS for Ionosphere and Space Weather Monitoring
    - Introduction to GNSS Receivers
    - GNSS Software Receiver Laboratory
  - Ionospheric Forecasting for GNSS Operation in Developing Countries, Trieste, Italy, 2019

- GNSS for Ionosphere and Space Weather Monitoring
- Air Force Research Laboratory, Wright Patterson Air Force Base, OH
  - Software Receiver Technologies, 2008, 2009

## SELECTED UNIVERSITY COMMITTEES AND SERVICES

- University of Colorado at Boulder
  - College of Engineering and Applied Sciences, Faculty Search Committee, 2020-21
  - Director for Colorado Center for Astrodynamics Research (CCAR), 2019 - Present
  - Associate Chair for Graduate Programs, Aerospace Engineering Sciences Dept., 2018- 2019
  - Aerospace Engineering Science Department Research Strategic Vision Committee, 2018
  - Executive Committee Member, Aerospace Engineering Sciences Dept., 2017-Present
  - Search Committee Member, Aerospace Engineering Sciences Dept., 2017-18
  - Committee member, Joint AES-EE MS degree program, 2017-18
  - Promotion and Tenure Evaluation Committee, 2017-present
  - Faculty Mentoring, 2017-Present
  - Senior Project Advisory Board, 2017-18
- Colorado State University
  - College of Engineering Strategic Plan Committee, Initiative 5 Enhance the Diversity of COE Students, Faculty and Staff, and Promote A Culture of Inclusiveness, 2016
  - Electrical and Computer Engineering Department, Faculty Promotion and Tenure (PNT) Committee, 2014-2017
- Miami University Electrical & Computer Engineering Department
  - Promotion & Tenure Committee, 2006-14
  - Chair, ECE Scholarship Committee, 2011-12
  - ABET Accreditation Committee, 2001-2011
  - Faculty Search Committee Chair, 2004-5, 2008-9
  - Undergraduate Curriculum Committee member, 2004-5, 2008-9
  - Faculty Search Committee member, 2000-2003, 2006-7
  - Chair, ECE Undergraduate Curriculum Committee, 2005-6
  - ECE Program Director Search Committee member, 2004-5
  - New ECE Programs Undergraduate Curriculum Committee, 2000-2
- Miami University School of Engineering & Applied Science
  - Mentor for Women Faculty, 2010-2014
  - Research Award Committee, 2005-7, 2009-13
  - Curriculum Committee, 2012-13
  - Advisor, Society of Woman Engineers, 2008-2010
  - Administrator Evaluation Committee, 2006-7
  - Research Council Member, 2005-7
  - Promotion and Tenure Committee, Mechanical & Manufacturing Eng. Department, 2011-12
- Miami University-wide Services
  - Speaker for numerous alumni, open house, advisory board, and outreach events, 2002-14
  - President 2020 Plan Target Goal Team Member, 2012-13
  - Sigma Xi Researcher of Year Award Committee Member, 2011-12
  - Sigma Xi Researcher of Year Award Committee Chair, 2011
  - Panel member, Academic Success Workshop for International Students, 2010, 2011
  - Search Committee Member, Vice President for Institutional Diversity, 2007
  - Search Committee Member, Associate Provost and Dean of Graduate School, 2005-6
  - Search Committee, Assistant to the President and Associate Provost for Diversity, 2004-5
  - Principle Investigator, the Presidential Fusion Project, 2001-2
- Community Outreach

- URSI National Radio Science Meeting Student Paper Awards Judge, 2019
- AGU Outstanding Student Presentation Awards Judge, 2018
- Co-host and organizer, STEM First Abilities outreach to high school female students, 2011-12
- Coach, Talawanda High School Robotics Competition Team, 2008-2010
- Speaker and workshop organizer for numerous Girl Scouts events, 2002-2010

## AWARDS AND HONORS

- Fellowships
  - Thomas F. Austin Faculty Fellow, University of Colorado Boulder, 2017-Present
  - Fellow, Royal Institute of Navigation (RIN), 2019
  - Fellow, Institute of Navigation (ION), 2015
  - Fellow, IEEE, 2014
  - Tan Chin Tuan Faculty Fellow, Nanyang Technological University, Singapore, 2014-15
  - National Research Council/AFOSR Summer Faculty Fellow, 2002, 2003, 2004
- General Recognition
  - Distinguished Performance Award, Aerospace Engineering Sciences Department, University of Colorado Boulder, 2019
  - IEEE Aerospace and Electronic Systems Society Distinguished Lecturer, 2019-21
  - GPS World Leadership Service Award, GPS World Magazine, 2015
  - Woman's Leadership Award, Miami University, 2013
  - Jennie Elder Suel Distinguished Woman of Color Award, Miami University, 2013
- Research Awards
  - Johannes Kepler Award, Institute of Navigation, 2020
  - Richard B. Kershner Award, IEEE Aerospace and Electronic Systems Society, 2020
  - Best session paper, ION GNSS+ Conference, 2004, 2007, 2011, 2014, 2015, 2016, 2017(2), 2018, 2019, 2020(4)
  - Best student presentation co-author, International Sym. GNSS, 2017
  - Samuel M. Burka Award, Editorial Board, Navigation, Journal of ION, 2017
  - Best paper and best presentation, ION Autonomous Snowplow Competition, 2014
  - Thurlow Award, ION, 2013
  - Distinguished Scholar, Miami University, 2013
  - Best paper, Colloquium Sci. Fundamental Aspects Galileo Program, 2013
  - Best paper in track, IEEE/ION PLANS Conference, 2012
  - Outstanding Researcher, School of Eng. & Applied Sci., Miami U., 2005, 2011
  - Best paper, IEEE NAECON, 2011
  - Sigma Xi Researcher of the Year, Miami U., 2009
  - Shoupp Award, Miami University Research Advisory Council, 2001, 2006
  - Charles Ryan Award Nominee, AFRL, WPAFB, 2005
  - Best student paper award, CPGPS International Technical Forum, 2007
  - First place, Annual Graduate Research Exhibition, Penn State University, 1990
- Teaching Awards
  - Finalist, Outstanding Professor Award, Associated Student Gov., Miami Univ., 2012
  - Outstanding Professor Nominee, Associated Student Gov., Miami U., 2004, 2006, 2011
  - Teaching Excellence award, School of Engineering & Applied Sci., Miami U., 2007
  - Teaching Effective Award Nominee, Miami University Alumni Association, 2006, 2007
  - Teaching Excellence Award, Committee for Enhancement of Learning, Miami Univ., 2005
- Advisor for Student Team Competitions Awards
  - 3<sup>rd</sup> place team advisor, AIAA Student Paper Competition, 2018
  - 1<sup>st</sup> place team advisor, ION Autonomous Snowplow Competition, 2014
  - 5<sup>th</sup> place Design Award, Intelligent Ground Vehicle Competition, 2013

- 2<sup>nd</sup> place team advisor, ION Autonomous Snowplow Competition, 2013
- 2<sup>nd</sup> place team advisor, ION Autonomous Lawnmower Competition, 2012
- 2<sup>nd</sup> place team advisor, ION Autonomous Snowplow Competition, 2012
- 1<sup>st</sup> place team advisor, Miami U. Interdisciplinary Tech. Dev. Competition (MUITDC), 2012
- 2<sup>nd</sup> place advisor, Int. Waveform Diversity & Design Conf. Student Paper Competition, 2012
- 1<sup>st</sup> place team mentor, MUITDC, 2011
- 2<sup>nd</sup> place team advisor, ION Autonomous Snowplow Competition, 2011
- 2<sup>nd</sup> place team mentor, ION MiniUrban Challenge Ohio Competition, 2010
- 1<sup>st</sup> place team mentor, ION MiniUrban Challenge Ohio Competition, 2009
- 2<sup>nd</sup> place & Best Production Plan advisor, ION Autonomous Lawnmower Competition, 2004

## SELECTED FUNDED RESEARCH PROJECTS

- Air Force Office for Scientific Research (AFOSR):
  1. PI: DURIP – Distributed small multi-GNSS arrays for ionospheric and space weather research. \$430K. 2019-20.
  2. PI: DURIP - Acquisition of a multi-constellation GNSS data collection array for high latitude ionospheric and space weather research. \$146K. 2016-17.
  3. PI: High latitude ionospheric scintillation studies using multi-constellation multi-band software GNSS receivers. \$396K. 2014-17.
  4. PI: Developing satellite signal parameter estimation algorithms for high-accuracy applications. \$650K. 2010-13.
  5. Co-PI: Precise GPS signal tracking in interference and multipath environment using a multi-channel software receiver. \$288K. 2008-10.
  6. PI: Three-frequency based high precision GPS receiver for navigation applications. \$285K. 2007-10.
  7. PI: DURIP - A multi-channel dual frequency radio frequency front end for anti-jamming software GPS receiver research. \$223K. 2007-8.
  8. PI: Integrated reconfigurable aperture, digital beam forming, and software GPS receiver for UAV navigation. \$263K. 2004-7.
  9. PI: Developing signal processing algorithms for weak GPS signal acquisition in urban environment. \$50K. 2003-4.
- Air Force Research Laboratory (AFRL):
  10. Co-PI: On-Demand PNT, \$3.3M. 2020-23.
  11. PI: Assured PNT through all modalities, \$1M. 2019-22.
  12. PI: Investigation of ionospheric effects on new satellite navigation signals. \$450K. 2019-22.
  13. PI: Capturing and characterization of the effects of plasma turbulence. \$66K. 2018-19.
  14. PI: Advanced novel spectrum warfare environment research. \$1.521M. 2015-19.
  15. Co-PI: Software-defined multi-functional LPI/LPD adaptive radar for network-centric applications. \$255K. 2015-18.
  16. PI: Collaborative research and development program on navigation and time-keeping with AFRL/RYRN. \$890K. 2008-15.
  17. Co-PI: Adaptive radar imaging with knowledge-based SAR. \$58K. 2012-13.
  18. PI: LADAR EO GPS/INS Atomic Clock Navigation Demonstration and Worldwide Accurate Sensor Positioning System technical support. \$120K. 2007-8.
  19. PI: An integrated spatial digital beam forming and adaptive periodogram technique for interference and jamming cancellation. \$15K. 2006.
  20. PI: Integrated navigation reference systems for micro-UAV information applications. \$65K. 2005-6.
  21. PI: Algorithm development for GPS interference cancellation. \$10K. 2002.

- Air Force Asian Office of Aerospace Research and Development (AOARD):
  - 22. Co-PI: Determination of precise satellite orbital position using multi-band GNSS signals. *\$100K. 2015-17.*
- Army:
  - 23. PI: Networked PNT solution (PNT-Net) for GPS-denied navigation, Phase I, *\$40K* subcontract from QuNav, 2020.
- DARPA:
  - 24. Co-PI: HEARTBEAT – Heliosphere to Earth Atmosphere Rendering Through Building Excellent Artificial-intelligence Training. *\$1.245M. 2019-22.*
- Dayton Area Graduate Studies Institute:
  - 25. PI: Multi-domain analysis of GNSS signals. *\$43.5K. 2013-14.*
  - 26. PI: Space weather effects on GNSS. *\$43.5K. 2013-14.*
  - 27. Co-PI: Physics-based modeling of sensor environment. *\$43.5K. 2013-14.*
  - 28. PI: Advanced GPS receiver algorithms for assured navigation. *\$80K. 2011-13.*
  - 29. Co-PI: Cognitive radar for autonomous systems. *\$95K. 2011-13.*
  - 30. PI: High accuracy GPS receiver algorithms for navigation. *\$73K. 2008-10.*
  - 31. PI: Multi-channel RF receiver/exciter systems. *\$59K. 2006-7.*
  - 32. PI: Intelligent sensing and control for autonomous vehicles. *\$43K. 2005-6.*
- DHS:
  - 33. PI: Networked GPS spoofing detection for power systems. Subcontract from University of Illinois Urbana-Champaign. *\$40K. 2017-18.*
- NASA:
  - 34. PI: Spire CubeSat GNSS-R Measurements for Physical Oceanography Research: A Comprehensive Analysis. *\$140K, 2020-21.*
  - 35. Co-PI: Phase-delay altimetry from reflected GNSS signals for resolving mesoscale ocean circulation features. *\$623K, 2019-22.*
  - 36. PI: Multi-GNSS radio occultation algorithms development for ionosphere irregularity studies with augmentation from ground-based GNSS networks. *\$800K. 2015-20.*
- NOAA:
  - 37. PI: Low elevation multi-GNSS signal processing for remote sensing. *\$532K. 2021-22.*
- NSF:
  - 38. PI: MRI - Acquisition of multi-constellation GNSS data collection arrays for low latitude ionospheric effects studies. *\$253K. 2014-17.*
  - 39. Co-PI: A study on the circulation and structure of metallic ions in the mid-latitude ionosphere. *\$342K. 2007-12.*
  - 40. Co-PI: Dual-beam incoherent scatter radar study of the mesosphere. *\$210K. 2003-6.*
- Office of Naval Research (ONR):
  - 41. Co-PI: STTR – Novel Nanosat Payloads for Naval Weather Needs. Subcontract from ASTRO. Phase I, *\$45K. 2017-18.* Phase II, *\$250K, 2019-21.*
- Private Industries
  - 42. PI: GNSS Skydel software and simulation tool, in-kind donation, Orolia, *\$293K. 2020.*
  - 43. PI: GPS Signal monitoring via machine learning, Lockheed Martin, *\$100K. 2019-20.*
  - 44. PI: Septentrio, Corporate Gift Fund, *\$13K. 2020.*
  - 45. PI: Consortium of Ohio Universities on Navigation and Timekeeping (COUNT) industrial affiliates. *\$248K. 2007-Present.*



46. PI: Honeywell, Ionosphere error research for Ground-Based Augmentation Systems (GBAS). Corporate Gift Fund, \$35K. 2016-17.
47. PI: Equipment donations from Freewave Technologies, John Deere/NavCom, Novetal, NPC, Snapper, Symmetricom (now Microsemi), Topcon, and Trimble Navigation. ~\$400K. 2004 - Present.

**SELECTED invited PRESENTATIONS:**

1. IEEE AES Distinguished Lecture: GPS As Signals-of-Opportunity for Ionosphere, Atmosphere, Ocean Surface, and Land Cover Remote Sensing, Virtual Lecture, Dec. 2020.
2. TREASURE Conference Invited Talk: GNSS Carrier Cycle Slips: Causes, Detection and Mitigation, Virtual, Oct. 2020.
3. European Navigation Conference, Invited Presentation: Expected and unexpected findings in mining massive GNSS data for ionospheric effects, Virtual, Nov. 2020.
4. IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Invited Presentation: Coherent GNSS Reflection Signal Processing, Virtual, October 2020.
5. Zonta District 12, Amelia Earhart Event: Navigating Beyond Borders with GPS, Feb. 2020.
6. IEEE AESS Distinguished Lecture: Satellite Navigation and Sensing, Singapore, January 2020.
7. International Navigation Conference, Keynote presentation: Satellite Navigation and Sensing – A Match Made in Heaven, Edinburgh, UK, 2019.
8. AFOSR: Satellite Navigation and Sensing – A Match Made in Heaven, Washington DC, November 2019.
9. NASA Earth Surface and Interior Workshop Lightning Talk: Multi-GNSS for Remote Sensing Applications, San Diego, CA, November 2019.
10. Stanford PNT Symposium: Synergy between Satellite Navigation and Remote Sensing, Palo Alto, CA, October 2019.
11. NASA Living With A Star Institute: Ionospheric Effects, Impacts, and Mitigation, Jackson, WY, October 2019.
12. Tsinghua University: “Position, Navigation, and Timing Technologies in the 21<sup>st</sup> Century: Update on the New PNT Books,” Beijing, China, May 2019.
13. Workshop on Ionospheric Forecasting for GNSS Operations in Developing Countries - Findings and Challenges: GNSS for ionosphere and scintillation monitoring, Trieste, Italy, May 2019.
14. University of Michigan: Satellite Navigation and Sensing – A Match Made in Heaven, Ann Arbor, MI, March 2019.
15. Nanyang Technological University: Advanced GNSS Receiver Technologies for Radio Occultation Signals Propagating through Ionosphere and Troposphere Structure, Singapore, January 2019.
16. Joint GEM-CEDAR Workshop: GNSS Data Processing Techniques for Ionosphere Monitoring. Santa Fe, NM, June 2018.
17. CEDAR Workshop: What Are the Goals of Predicting Ionospheric Disturbances from A GPS Perspective? Santa Fe, NM, June 2018.
18. URSI Atlantic Radio Science Meeting: Scintillation Monitoring and Analysis Using Multi-Frequency GNSS Measurements, Gran Canaria, May 2018.
19. Chinese Satellite Navigation Conference, CSNC-ION Panel: Satellite Navigation and Sensing – A Match Made in Heaven, Harbin, China, May 2018.
20. Politecnico di Torino, Natural and Artificial Threats to GNSS Workshop, Keynote Presentation: Satellite Navigation and Sensing – A Match Made in Heaven, Torino, Italy, May 2018.
21. Future Engineering and Global Women’s Symposium: A Better Future Created by Engineering – Ethical Implications of Scientific and Engineering Advances, Changsha, China, April 2018.
22. University of Arizona: Satellite Navigation and Sensing – A Match Made in Heaven, Tucson, AZ, February 2018.

23. URSI National Radio Science Meeting, Plenary Presentation: Radio Navigation Systems – New Challenges and Opportunities, Boulder, CO, January 2018.
24. International Technical Symposium on Navigation and Timing, keynote presentation: Satellite Navigation and Ionosphere Monitoring – Turning a Threat into Signals-of-Opportunity, Toulouse, France, November 2017.
25. URSI General Assembly: Advances in Ionospheric Remote Sensing Using New GNSS Signals. Montreal, Canada, August 2017.
26. Stanford University: Satellite-based Navigation and Sensing – A Match Made in Heaven. Stanford, CA, March 2017.
27. NOAA: GNSS for Space Weather Monitoring. Boulder, CO, Feb. 2017.
28. Science Highlight Presentation at NSF Coupling, Energetics, and Dynamics of Atmospheric Regions (CEDAR) Workshop: GNSS for Ionosphere Remote Sensing. Santa Fe, NM, June 2016.
29. Stanford University: GNSS for Remote Sensing Applications. Palo Alto, CA, May 2016.
30. AFRL, GNSS Remote Sensing, Kirkland AFB, NM, May 2016.
31. AFRL, Ionospheric Correction for GPS, Kirkland AFB, NM, May 2016.
32. AFRL, Novel Satellite Navigation Signals Design, Albuquerque, NM, May 2016.
33. HAARP Workshop: Ionosphere Heating Effects on Space-Based System. Albuquerque, NM. May 2016.
34. RF Ionosphere Interaction Workshop: Capturing Artificial Heating Effects on GPS Signals and Their Potential Applications. Albuquerque, NM. May 2016.
35. University of Colorado Boulder, Aerospace Engineering Science Department: GNSS for Remote Sensing. Boulder, CO. April 2016.
36. American Geophysical Union (AGU) Meeting: Multi-GNSS for Space Weather Monitoring and Forecasting. San Francisco, CA. December 2015.
37. ION Southern California Section: Multi-GNSS for Distributed Atmospheric Remote Sensing. Los Angeles, CA. November 2015.
38. International Symposium on Equatorial Aeronomy: Longitudinal Dependence of Equatorial Ionospheric Effects Based on an Event-Driven Multi-GNSS Data Collection System. Bahir Dar, Ethiopia. October 2015.
39. CEDAR Workshop: Comparative Characteristics of Equatorial Scintillation Based on Measurements from Jicamarca, Hong Kong, Singapore, Alaska, and Ascension Island. Seattle, WA. June 2015.
40. UNAVCO: Multi-GNSS for Ionospheric Monitoring. Boulder, CO. June 2015.
41. Ionospheric Effects Symposium: High-latitude and Equatorial Ionospheric Scintillation Based on an Event-Driven Multi-GNSS Data Collection System. Alexandria, VA. May 2015.
42. Colorado State University, College of Engineering: Global Navigation Satellite Signals for Space Weather Monitoring. Fort Collins, CO, May 2015.
43. Singapore DSO: Software Defined GNSS Receivers for Atmospheric Remote Sensing. Singapore, January 2015.
44. Jet Propulsion Laboratory: Challenges and Opportunities in Using GNSS for Ionosphere Monitoring. Pasadena, CA, September 2014.
45. The International Union of Radio Science (URSI) General Assembly and Scientific Symposium (GASS): Multi-constellation GNSS observations of equatorial ionospheric scintillation. Beijing, China, August 2014.
46. NAECOM Keynote Presentation: Sensing and Navigation Using Global Navigation Satellite Systems Signals. Dayton, OH, July 2014.
47. The 20<sup>th</sup> Annual RF Ionospheric Interactions Workshop: GNSS - A Diagnostics Tool for Ionosphere Modification Effects. Arecibo Observatory, Puerto Rico, April 2014.
48. Arecibo Observatory Seminar: Challenges and Opportunities of GNSS in Ionosphere Measurements. Arecibo Observatory, Puerto Rico, April 2014.

49. White House Office for Science and Technology Auroral Workshop: Research and Education on Global Navigation Satellite Signals (GNSS) using HAARP. Washington DC, January 2014.
50. The International Union of Radio Science (URSI) National Radio Science Meeting: Multi-constellation Multi-frequency GNSS Scintillation. Boulder, CO, January 2014.
51. Stanford University PNT Symposium: International Monitoring of Ionosphere. Palo Alto, CA, November 2013.
52. National Academy of Science: Overview of Basic Issues Related to Ionospheric Modification: GNSS Scintillation. Washington DC, May 2013.
53. NOAA: Satellite Navigation Signals for Ionospheric Remote Sensing Applications. Washington DC, May 2013.
54. Plenary Presentation at the Chinese Satellite Navigation Conference: Global Navigation Satellite Signals for Space Weather Research. Wuhan, China, May 2013.
55. Colorado State University: Global Navigation Satellite Systems and Ionospheric Remote Sensing. Fort Collins, CO, April 2013.
56. The Ohio State University: GNSS for Space Weather Studies. Columbus, OH, Feb. 2013.
57. American Geophysical Union (AGU) Meeting: Characteristics of High Latitude Ionosphere Scintillations. San Francisco, CA, Dec. 2012.
58. Stanford University, GPS Lab: Ionosphere Scintillation - Measurement and Analysis, Palo Alto, CA, Dec. 2012.
59. Jicamarca Radio Observatory: Ionosphere Effects on GNSS, Peru, Nov. 2012.
60. Illinois Institute of Technology: Ionosphere Scintillation of GNSS Signals. Chicago, IL, Oct. 2012.
61. Polar Aeronomy and Radio Science Workshop: GPS research at HAARP. HAARP, AK, Aug. 2012.
62. AFRL/RYP: GPS Multipath - A Nuisance or Signals-Of-Opportunity? Dayton, OH, July 2012.
63. Coupling, Energetics, and Dynamics of Atmospheric Regions Workshop: Time-Frequency Analysis of GPS Scintillations at HAARP. Santa Fe, NM, June, 2012.
64. New GNSS Algorithms and Techniques for Earth Observations Workshop: How GNSS Signal Processing Alters Signal Parameters: A Cautionary Tale in Using GNSS for Remote Sensing Applications. Hong Kong, May 2012.
65. Ionosphere Interactions Workshop: Capturing GNSS Scintillations at HAARP. Santa Fe, NM, April 2012.
66. Nanyang Technological University: GNSS Ionospheric Scintillation. Singapore, March 2012.
67. Hong Kong Polytechnic University: GNSS Research. Hong Kong, January 2012.
68. ION North Star Section: Ionosphere Effects and GNSS and RF Navigation Research. Nov. 2011.
69. CEDAR Workshop: Multiband GNSS Scintillation. Santa Fe, NM, June 2011.
70. AFOSR Program Review: Ionosphere Scintillation Effects on GNSS Receivers. Eglin AFB, June 2011.
71. Chinese Satellite Navigation Conference: GNSS Receivers for Ionosphere Scintillation Studies. Shanghai, China, May 2011.
72. Miami University Farmer Business School: Chinese Science and Technology - History, Recent Development, and Future Outlook. Oxford, OH, Feb. 2011.
73. AFOSR Singapore PNT Workshop: Ionosphere Effects. Honolulu, Hawaii, Dec. 2010.
74. Washington University, Electrical and Systems Engineering Department: A GPS Multipath Estimation and Mitigation Technique for High Accuracy Applications. St. Louis, MO, Oct. 2010.
75. AFRL, Next Generation Radar Workshop: Overview of Miami University Current Radar and Navigation Research Efforts. Dayton, OH, Aug. 2010.
76. CEDAR Workshop: GPS Receivers Measurements of L-Band Ionosphere Scintillations at HAARP, Alaska. Boulder, CO, June 2010.
77. AFOSR Program Review: GPS Multipath Detection, Estimation, and Mitigation Using Multi-Channel Software Receivers. Waltham, MA, June 2010.

78. International Antarctic Science Workshop: Arctic GPS. Albany, NY, May 2010.
79. Virginia Tech: Ionosphere Effect on GPS Measurements and GPS Receiver Algorithms for High Accuracy Applications. Blacksburg, VA, Dec. 2009.
80. Miami University Sigma Xi Researcher of the Year Presentation: The Global Positioning System - Past, Present, and Future. Oxford, OH, Sep. 2009.
81. Johns Hopkins University Applied Physics Research Laboratory: Higher Order Ionosphere Error in GPS Measurements. Laurel, MD, Aug. 2009.
82. University of Calgary: GPS Self-Interference and Mitigation. Calgary, Canada, Jun. 2009.
83. Istituto Superiore Mario Boella: Recent Position, Location, and Navigation Research Activities at Miami University. Torino, Italy, Apr. 2009.
84. Miami University SEAS 50th Anniversary: Position, Location, and Navigation – Anywhere, Anytime. Oxford, OH, Apr. 2009.
85. Stanford University, GPS Lab: Navigation Research at Miami. Palo Alto, CA, May 2008.
86. NAVAIR: Second Order Ionosphere Error Assessment and Low Power Short Delay Multipath Detection. Paxton River, MD, May 2008.
87. ION Dayton Section, Dayton: High Order Ionosphere Error. Dayton, OH, Mar. 2008.
88. IEEE IMS Workshop on Quality of Automotive RF Systems: Evaluation of GPS receivers. San Francisco, CA, Jun. 2006.
89. Department of Mathematics, Miami University: Some Applied Mathematical Problems in Navigation. Oxford, OH, Apr. 2006.
90. Pi Mu Epsilon National Mathematics Society, Miami Chapter: Integrating Digital Beam Forming and Software Receivers for UAV Application. Oxford, OH, Sept. 2005.
91. Nanjing University: Software GPS Receiver. Nanjing, China, June 2005.
92. IEEE IMS Workshop on Software Defined Radio: Integrating Beam Forming and A Software GPS Receiver. Long Beach, CA, Jun. 2005.
93. Miami University Research Advisory Council: Software-Based Global Positioning Systems Receiver and Applications. Oxford, OH, Apr. 2005.
94. Illinois Institute of Technology, ECE Distinguished Speaker Seminar Series: Software GPS Receivers and Applications. Chicago, IL, Dec. 2004.
95. IEEE Cincinnati Chapter: The Miami Red Blade - An Autonomous Lawn Mower. Cincinnati, OH, Oct. 2004.
96. Embry Riddle Aeronautics University: Software GPS Receiver. Daytona Beach, FL., Feb. 2003.
97. Embry Riddle Aeronautics University: Modeling and Measurements of the Upper Atmosphere Electron Density Irregularities. Daytona Beach, FL., Feb. 2003.

PUBLICATONS (Students, post-docs, and research staff names are italicized)

- J1. *Breitsch, B., D. Xu, Y. Morton, C. Rino*, “GNSS carrier phase transitions due to diffractive ionosphere scintillation: simulation and characterization,” *IEEE Trans. Aero. Elec. Sys.*, DOI:10.1109/TAES.2020.2979025, 2020.
- J2. *Chen, X., Y. Morton, W. Yu, T-K Truong*, “GPS L1CA/BDS B1I multipath channel measurements and modeling for dynamic land vehicles in Shanghai dense urban area,” *IEEE Trans. Vehicular Tech.*, doi:10.1109/TVT.2020.3038646, 2020.
- J3. *Collett, I., Y. Morton, B. Breitsch*, “Characterization and mitigation of interference between GNSS radio occultation and reflectometry signals for low altitude occultations,” *Navigation, J. Institute of Navigation*, 1-10, <https://doi.org/10.1002/navi.375>, 2020.
- J4. *Liu, Y., Y. Morton*, “Automatic detection of ionospheric scintillation-like GNSS satellite oscillator anomaly using a machine leaning algorithm,” *Navigation, J. Institute of Navigation*, <http://dx.doi.org/10.1002/navi.385>, 2020.
- J5. *Rino, C., B. Breitsch, Y. Morton, D. Xu, C. Carrano*, “GNSS signal phase, TEC, and phase scintillation,” *Navigation, J. Institute of Navigation*, DOI: 10.1002/navi.396, 2020.

- J6. Wang, P., Y. Morton, "Performance comparison of time-of-arrival estimation techniques for LTE signals in realistic multipath propagation channels," accepted, *Navigation, J. of Institute of Navigation*, 2020.
- J7. Wang P., Y. Morton, "Multipath estimating delay lock loop for LTE signal TOA estimation in indoor and urban environments," *IEEE Trans. Wireless Comm.*, 19(8), 5518-5530, doi: [10.1109/TWC.2020.2994037](https://doi.org/10.1109/TWC.2020.2994037), 2020.
- J8. Wang, P., Y. Morton, "Efficient weighted centroid technique for crowdsourcing GNSS RFI localization using differential RSS," *IEEE Trans. Aero. Elec. Sys.*, 56(3):2471-2477, doi:10.1109/TAES.2019.2917577, 2020.
- J9. Wang, Y., B. Breitsch, Y. Morton, "A state-based method to simultaneously reduce cycle slips and noise in coherent GNSS-R phase measurements from open-loop tracking," accepted, *IEEE Trans. Geosci. Remote Sensing*, 2020.
- J10. Wang, Y., Y. Morton, "Coherent GNSS reflection signal processing for high-precision and high-resolution spaceborne applications," *IEEE Trans. Geosci. Remote Sensing*, doi:10.1109/TGRS.2020.2993804, 2020.
- J11. Wang, Y., R. Yang, Y. Morton, "Kalman filter-based robust closed-loop carrier tracking of airborne GNSS radio-occultation signals," *IEEE Trans. Aero. Elec. Sys.*, doi:10.1109/TAES.2020.2972248, 2020.
- J12. Xu, D., Y. Morton, C. Rino, C. Carrano, Y. Jiao, "A two-parameter multifrequency GPS signal simulator for strong equatorial ionospheric scintillation: modeling and parameter characterization," *Navigation, J. Institute of Navigation*, 67:181-195, DOI:10.1002/navi/350, 2020.
- J13. Yang, Z., Y. Morton, "Low-latitude ionospheric scintillations of multi-constellation GNSS signals in relation to magnetic field orientation," *J. of Geodesy*, 94(6), 1-15, 2020.
- J14. Yang, Z., Y. Morton, I. Zakharenkova, I. Cherniak, S. Song, W. Li, "Global view of ionospheric disturbances impacts on kinematic GPS positioning solutions during the 2015 St. Patrick's Day storm," *J. Geophys. Res., Space Sci.*, DOI: 10.1029/2019JA027681, 2020.
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- J20. Yang, R., D. Xu, Y. Morton, "Generalized multi-frequency GPS carrier tracking architecture: design and performance analysis," *IEEE Trans. Aero. Elec. Sys.*, DOI:10.1109/TAES.2019.2948535, 2019.
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- J27. Jiao, Y., J. Hall, Y. Morton, "Performance evaluation of an automatic GPS ionospheric phase scintillation detector using a machine-learning algorithm," *Navigation, J. Institute of Navigation*, 64(3):391-402, DOI:10.1002/navi.188, Summer 2017.
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- J30. Xu D., Y. Morton, "Semi-open loop estimation of GPS carrier phase variations during deep amplitude fading of equatorial ionospheric scintillation," *IEEE Trans. Aero. Elec. Sys.*, DOI: 10.1109/TAES.2017.2764778, PP(99), 2017.
- J31. Wang, J., Y. Morton, "A comparative study of ionospheric irregularity drift velocity derived from a GNSS receiver array and PFISR measurements during high latitude ionospheric scintillation," *J. Geophys. Res.*, 122(6): 6858-6881, DOI:10.1002/2017JA024015, 2017.
- J32. Yang, R., K. Ling, E. Poh, Y. Morton, "Generalized GNSS signal carrier tracking in challenging environments: part I – modeling and analysis," *IEEE Trans. Aero. Elec. Sys.*, 53(4):1782-1797, DOI:10.1109/TAES.2017.2673998, 2017.
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- J35. Jiao, Y., D. Xu, Y. Morton, C. Rino, "Equatorial scintillation amplitude fading characteristics across the GPS frequency bands," *Navigation, J. Institute of Navigation*, 63(3), 267-281, 2016. (*Burka Award Winner*)
- J36. Jiao, Y., Y. Morton, "Comparison of the effects of high-latitude and equatorial ionospheric scintillation on GPS signals during the maximum of solar cycle 24," *Radio Sci.*, 50(9), 886-903, 10.1002/2015RS005719, 2015.
- J37. Najmi, A., G. Milikh, Y. M. Yampolski, A. V. Koloskov, A. A. Sopin, A. Zalizovski, P. Bernhardt, S. Briczinski, C. Siefring, K. Chiang, Y. Morton, S. Taylor, A. Mahmoudian, W. Bristow, M. Rohoniemi, and K. Kapadopoulos, "Studies of the ionospheric turbulence excited by the fourth gyroharmonic at HAARP," *J. Geophys. Res., Space Sci.*, 120(8), 6646-6660, 2015.
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- J39. Prikryl, P., R. Ghoddousi-Fard, L. Spogli, C. N. Mitchell, G. Li, B. Ning, P. J. Cilliers, V. Sreeja, M. Aquino, M. Terkildsen, P. T. Jayachandran, Y. Jiao, Y. T. Morton, J. M. Ruohoniemi, E. G. Thomas, Y. Zhang, A. T. Weatherwax, L. Alfonsi, G. De Franceschi, V. Romano, "GPS phase scintillation at high latitudes during geomagnetic storms of 7-17 March 2012 – Part 2: Interhemispheric comparison," *Ann. Geophys.*, doi: 10.1002/2015JA021341, 2015.
- J40. Wang, J., Y. Morton, "High latitude ionospheric irregularity drift velocity estimation using spaced GPS receiver carrier phase time-frequency analysis," *IEEE Trans. Geosci. Remote Sensing*, 53(11), 6099-6113, doi:10.1109/TGRS.2015.2432014, 2015.
- J41. Yin, H., Y. Morton, M. Carroll, E. Vinande, "Performance analysis of L2 and L5 CNAV broadcast ephemeris for orbit calculation," *Navigation, J. Institute of Navigation*, 62(2), 121-140, Summer 2015.
- J42. Garmatyuk, D., B. Jameson, R. Cole, Y. Morton, S. Mudaliar, "Target scene frequency diversity exploitation with UWB OFDM radar," *IET Radar, Sonar, Navigation*, 8(9), 1247-1254, 2014.
- J43. Liu, X., M. Liang, Y. Morton, P. Closas, T. Zhang, and Z. Hong, "Performance evaluation of MSK and OFDM modulations for future GNSS signals," *GPS Solutions*, doi 10.1007/s10291-01400368-6, 1-13, 2014.
- J44. Park, J., D. Grejner-Brzezinska, R. von Frese, Y. Morton, "GPS discrimination of traveling ionospheric disturbances from underground nuclear explosions and earthquakes," *Navigation, J. Institute of Navigation*, 61(2), 125-134, 2014.
- J45. Kou, Y., Y. Morton, "Oscillator frequency offset impact on software GPS receivers and correction algorithms," *IEEE Trans. Aero. Elec. Sys.*, 49(4), 2158-2178, 2013.
- J46. Chen, X., Y. Morton, F. Dovis, "A computationally efficient iterative MLE for GPS AOA estimation," *IEEE Trans. Aero. Elec. Sys.*, 49(4), 2707-2716, 2013.
- J47. Chen, X., F. Dovis, S. Peng, Y. Morton, "Comparative studies of GPS multipath mitigation methods performance," *IEEE Trans. Aero. Elec. Sys.*, 49(3), 1555-1568, 2013.
- J48. Jiao, Y., Y. Morton, S. Taylor, W. Pelgrum, "Characterization of high latitude ionospheric scintillation of GPS signals," *Radio Sci.*, 48, doi:10.1002/2013RS005259, 2013.
- J49. Kauffman, K., J. Raquet, Y. Morton, D. Garmatyuk, "Real-time UWB-OFDM radar based navigation in unknown terrain," *IEEE Trans. Aero. Elec. Sys.*, 49(3), 1453-1466, 2013.
- J50. Zhang, L., Y. Morton, "GPS carrier phase spectrum estimation for ionospheric scintillation studies," *NAVIGATION, J. Institute of Navigation*, 60(2), 113-122, Summer 2013.
- J51. Peng, S., Y. Morton, "A USRP2-based reconfigurable multi-constellation multi-frequency GNSS software receiver front end," *GPS Solutions*, DOI: 10.1007/s10291-012-0263-y, 2012.
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#### Conference Papers:

- C1. Morton, Y., Y. Liu, Z. Yang, Y. Wang, B. Breitsch, H. Bourne, S. Taylor, "Expected and unexpected findings in mining massive GNSS data for ionospheric effects," *Proc. European Navigation Conference*, Virtual, 2020. (Invited)
- C2. Breitsch, B., Y. Wang, Y. Morton, "Performance of cycle slip filtering algorithm during ionosphere scintillation," *Proc. ION GNSS+*, Virtual, Sept. 2020.
- C3. Chang, H., J. Lee, Y. Wang, B. Breitsch, Y. Morton, "Preliminary assessment of CICERO radio occultation by comparing with COSMIC I data," *Proc. ION GNSS+*, Virtual, Sept. 2020.
- C4. Liu, Y., Y. Morton, "Machine learning-based two-stage detection and comprehensive characterization of ionospheric scintillation-like GPS satellite oscillator anomaly," *Proc. ION GNSS+*, Virtual, Sept. 2020. (Best Presentation)
- C5. Yang, R., X. Zhan, J. Huang, Y. Morton, "GNSS multi-frequency carrier tracking with cycle slip detection and mitigation under strong ionosphere scintillation," *Proc. ION GNSS+*, Virtual, Sept. 2020.
- C6. Yang, Z., Y. Morton, "Time lags in ionospheric scintillation response to geomagnetic storms: Alaska observations," *Proc. ION GNSS+*, Virtual, Sept. 2020. (Best presentation)
- C7. Yun J., B. Park, J. Morton, "Detecting ionospheric irregularity based on ROT variation using Android devices cloud system," *Proc. ION GNSS+*, Virtual, Sept. 2020. (Best presentation)
- C8. Wang, P., Y. Morton, "Carrier phase tracking architecture for positioning in LTE networks under channel fading conditions," *Proc. ION GNSS+*, Virtual, Sept. 2020.
- C9. Wang, Y., Y. Morton, "Coherent and semi-coherent spaceborne GNSS-R for land surface altimetry applications," *Proc. ION GNSS+*, Virtual, Sept. 2020. (Best presentation)
- C10. Collett, I., Y. Wang, R. Shah, C. Roesler, Y. Morton, "GPS signal land reflection coherence dependence on water extent and surface topography using CYGNSS measurements," *Proc. IGARSS*, Virtual, Oct. 2020.
- C11. Morton, Y., Y. Wang, R. Yang, "Coherent GNSS reflection signal processing for precision altimetry applications," *Proc. IGARSS*, Virtual, Oct. 2020. (invited)
- C12. Roesler, C., Y. Wang, Y. Morton, R. S. Nerem, "Coherent GPS reflections over ocean surface," *Proc. IGARSS*, Virtual, Oct. 2020.

- C13. Wang, P., Y. Wang, Y. Morton, "Characterization and impact analysis of radio frequency interference for GNSS reflectometry," *Proc. IGARSS, Virtual, Virtual, Oct. 2020*.
- C14. Wang, Y., Y. Liu, Y. Morton, "Detection of coherent GNSS-R measurements using a Support Vector Machine," *IGARSS, Virtual, Oct. 2020*.
- C15. Breitsch, B., Y. Morton, D. Xu, R. Yang, "Study of the effect of ionosphere scintillation-induced deep fades on multi-frequency GNSS carrier phase," *Proc. IEEE/ION PLANS meeting, 2020*.
- C16. Krier, W., Y. Morton, "Conjugate transfer function compensation of ionospheric refractive effects," *Proc. IEEE/ION PLANS meeting, 2020*.
- C17. Lu, X., X. Guo, S. Guo, X. Li, K. Jiang, J. Morton, "Update on BeiDou Navigation Satellite System and PNT System," *Proc. IEEE/ION PLANS, 2020*.
- C18. Wang, P., Y. Morton, "Improved time-of-arrival estimation algorithm for cellular signals in multipath fading channels," *Proc. ION/IEEE PLANS, April 2020*.
- C19. Yang, Z., S. Mrak, Y. Morton, "Geomagnetic storm induced mid-latitude ionospheric plasma irregularities and their implications for GPS positioning over North America: a case study," *Proc. IEEE/ION PLANS meeting, 2020*.
- C20. Breitsch, B., Y. Morton, D. Xu, "Ionosphere scintillation-induced phase transitions in triple-frequency GPS measurements," *Proc. ION ITM/PTTI, San Diego, CA, 2020*.
- C21. Chen, X., Y. Morton, D. He, "GPS L1CA/BDS B1I NLOS signal measurements and modeling in dense urban area," *Proc. ION ITM/PTTI, San Diego, CA, 2020*.
- C22. Liu, Y., Y. Morton, "Machine learning-based automatic detection and characterization of GNSS satellite clock anomaly using dual frequency signals," *Proc. ION ITM/PTTI, San Diego, CA, 2020*.
- C23. Sun, K., J. Lee, J. Seo, Y. Morton, S. Pullen, "Performance benefit from dual-frequency GNSS-based aviation applications under ionospheric scintillation: a new approach on fading process modeling," *Proc. ION ITM/PTTI, San Diego, CA, 2020*.
- C24. Yang, R., X. Zhan, Y. Wang, Y. Morton, J. Hasse, "Hybrid tracking and position determination using low elevation satellite signals," *Proc. ION ITM/PTTI, San Diego, CA, 2020*.
- C25. Breitsch, B., Y. Morton, "Robust estimation of diffraction-induced phase transitions and cycle slips during strong ionospheric scintillation," *Proc. ION GNSS+, Miami, FL, 2019*.
- C26. Collett, I., Y. Morton, "Ocean vector wind retrieval from delay-Doppler maps using ambiguous stare processing," *Proc. ION GNSS+, Miami, FL, 2019. (Best Presentation)*
- C27. Liu, Y., Y. Morton, "Automatic detection and characterization of ionospheric scintillation-like GNSS satellite and receiver oscillator anomaly," *Proc. ION GNSS+, Miami, FL, 2019*.
- C28. Park, B., C. Lim, J. Wang, Y. Morton, "A new method to estimate ionospheric irregularity drift velocity using ROT variation and spaced GNSS reference stations," *Proc. ION GNSS+, Miami, FL, 2019*.
- C29. Wang, P., Y. Morton, "Performance comparison of time-of-arrival estimation techniques for LTE signals in realistic multipath propagation channels," *Proc. ION GNSS+, Miami, FL, 2019*.
- C30. Wang, Y., Y. Morton, "Coherent components of GNSS-R signal observed from CYGNSS raw IF data," *Proc. ION GNSS+, Miami, FL, 2019*.
- C31. Xu, D., Y. Morton, "A two-parameter GNSS signal simulator for strong equatorial ionospheric scintillation," *Proc. ION GNSS+, Miami, FL, Sept. 2019*.
- C32. Yang, Z., Y. Morton, "Kinematic PPP errors associated with ionospheric plasma irregularities during the 2015 St. Patrick's day storm," *Proc. ION GNSS+, Miami, FL, 2019*.
- C33. Morton, Y. T., B. Bourne, B. Breitsch, Y. Liu, B. Park, C. Rino, S. Taylor, Y. Wang, D. Xu, "Measurement of ionospheric and atmospheric structures using navigation satellite signals captured with software-defined systems," *Int. Beacon Satellite Sym., BSS-2019, Mazury, Poland, August 2019. (Invited)*
- C34. Liu, Y., I. Collett, Y. Morton, "A machine learning framework for real data GNSS-R wind speed retrieval," *Proc. 2019 IEEE Int. Geosci. Remote Sensing Sym., Yokohoma, Japan, July 2019*.

- C35. Shah, R., J. Morton, Y. Wang, I. Collett, S. Yueh, "Characterization of coherence properties of signals of opportunity over land surface," *Proc. IGARSS*, Yokohoma, Japan, July 2019.
- C36. Wang, Y., Y. Morton, "Coherent reflections using closed-loop PLL processing of CYGNSS IF data," *Proc. IGARSS*, Yokohoma, Japan, July 2019.
- C37. Liu, Y., I. Collett, Y. Morton, "Application of machine learning to GNSS-R wind speed retrieval," *Proc. ION GNSS+*, Miami, FL, Sept. 2018.
- C38. Wang, J., Y. Morton, "A hybrid correlation method from the anisotropy model and the front velocity model for ionospheric irregularity drift velocity estimation using GNSS spaced-receiver array," *Proc. ION GNSS+*, Miami, FL, Sept. 2018.
- C39. Yang, R., Y. Morton, "Hybrid carrier tracking and position determination using low elevation satellite signals," *Proc. ION GNSS+*, Miami, FL, Sept. 2018.
- C40. Wang, Y., Y. Morton, R. Yang, F. van Graas, J. Hasse, "Robust closed-loop tracking of airborne low-elevation GPS radio-occultation signals," *Proc. ION GNSS+*, Miami, FL, Sept. 2018.
- C41. Xu, D., Y. Morton, Y. Jiao, R. Yang, "Implementation and performance evaluation of a vector-based receiver during strong equatorial scintillation on dynamic platforms," *Proc. ION GNSS+*, Miami, FL, Sept. 2018.
- C42. Mahmoudian, A., J. Morton, B. Isham, W. A. Scales, P. A. Bernhardt, E. Nossa, S. J. Briczinski, D. Papadopoulos, G. Milikh, "Recent observations and modeling of ionospheric stimulated electromagnetic emissions," *Proc. URSI AT RASC*, Gran Canaria, May 2018.
- C43. Breitsch, B., Y. Morton, "Study of the effects of ionosphere scintillation-induced deep fades on multi-frequency GNSS carrier phase," *Proc. IEEE/ION PLANS*, Monterey, CA, April 2018.
- C44. Liu, Y., Y. Morton, Y. Jiao, "Application of machine learning to the characterization of GPS L1 ionospheric amplitude scintillation," *Proc. IEEE/ION PLANS*, Monterey, CA, April 2018.
- C45. Xu, D., Y. Morton, Y. Jiao, C. Rino, "Simulation and tracking algorithm evaluation for scintillation signals on LEO satellites traveling inside the ionosphere," *Proc. IEEE/ION PLANS*, Monterey, CA, April 2018.
- C46. Yang, R., D. Xu, Y. Morton, "An improve adaptive multi-frequency GPS carrier tracking algorithm for navigation in challenging environments," *Proc. IEEE/ION PLANS*, Monterey, CA, April 2018.
- C47. Myer, G., Y. Morton, "Ionosphere scintillation effects on GPS measurements, a new carrier-smoothing technique, and positioning algorithms to improve accuracy," *Proc. of ION ITM*, Reston, VA, Jan. 2018.
- C48. Yang, R., Y. Morton, "An adaptive inter-frequency aiding carrier tracking algorithm for mountain-top GPS radio occultation signal," *Proc. ION ITM*, Reston, VA, Jan. 2018.
- C49. Rino, C., B. Breitsch, Y. Morton, Y. Jiao, D. Xu, C. Carrano, "A new GNSS scintillation model," *Proc. URSI National Meeting*, Boulder, CO, Jan. 2018.
- C50. Yang, Z., Y. Morton, Z. Liu, "Post-processing analysis of ionospheric scintillation effects on RTK GPS positioning at low-latitude region," *Proc. Int. Sym. GNSS*, Hong Kong, Dec. 2017. (*Best student paper award*)
- C51. Jiao, Y., C. Rino, Y. Morton, "Scintillation simulation on equatorial GPS signals for dynamic platforms," *Proc. ION GNSS+*, 1644-1657, Portland, OR, Sept. 2017.
- C52. Wang, J., Y. Morton, Robinson, R., "Spaced multi-GNSS receiver array as ionosphere radar for irregularity drift velocity estimation during high latitude ionospheric scintillation," *Proc. ION GNSS+*, 3389-3401, Portland, OR, Sept. 2017.
- C53. Rino, C., B. Breitsch, Y. Jiao, D. Xu, Y. Morton, C. Carrano, "A new GNSS scintillation model," *Proc. ION GNSS+*, 3879-3887, Portland, OR, Sept. 2017. (*Best Paper Award*)
- C54. Breitsch, B., Y. Morton, C. Rino, "Long-term analysis of carrier phase residual variations using geometry-ionosphere-free combination of triple-frequency GPS observations," *Proc. ION GNSS+*, 4122-4138, Portland, OR, Sept. 2017. (*Best Paper Award*)

- C55. Xu, D., Y. Morton, Y. Jiao, C. Rino, "Robust GPS carrier tracking algorithms during strong equatorial scintillation for dynamic platforms," Proc. ION GNSS+, 4112-4121, Portland, OR, Sept. 2017.
- C56. Yang, R., Y. Morton, B. Han, "An adaptive carrier tracking algorithm for low latitude mountain-based GPS radio occultation measurement," Proc. ION GNSS+, 3767-3774, Portland, OR, Sept. 2017.
- C57. Collett, I., Y. Morton, "Simulation study of the common surface scenario in GNSS-reflectometry," Proc. IGARSS, Italy, July 2017.
- C58. Liu, Y., I. Collett, Y. Morton, S. Hrbek, D. Akos, "Mountaintop ocean reflectometry with dual frequency GPS signals: experiment and preliminary results," Proc. IGARSS, Italy, July 2017.
- C59. Baucher, B., I. Qualls, D. Garmatyuk, Y. Morton, S. Mudaliar, "Experimental radar-enabled navigation with UWB system in indoor environments," *Int. Radar Sym.*, May 2017.
- C60. Kellett, D., D. Garmatyuk, Y. Morton, S. Mudaliar, "Radar Communications via Random Sequence Encoding," *Int. Radar Sym.*, May 2017.
- C61. Morton, Y., H. Bourne, S. Taylor, D. Xu, R. Yang, F. van Graas, N. Pujara, "Mountain-top radio occultation with multi-GNSS signals: experiment and preliminary results," *Proc. Pacific PNT*, Honolulu, HI, May 2017.
- C62. Morton, Y., D. Xu, H. Bourne, B. Breitsch, Taylor, S., F. van Graas, N. Pujara, "Ionospheric scintillation observations in Singapore using a high gain antenna and SDR," *Proc. Pacific PNT*, Honolulu, HI, May 2017.
- C63. Collett, I., B. Breitsch, D. Xu, Y. Morton, "Statistical characterization of GNSS signal carrier Doppler frequency deviations during ionospheric scintillation," *Int. Iono. Effects Sym.*, Alexandria, VA, May 2017.
- C64. Rino, C., C. Carrano, Y. Jiao, B. Breitsch, J. Morton, "Simulation study of GPS phase scintillation," *Int. Iono. Effects Sym.*, May 2017.
- C65. Wang, J., Y. Morton, "A comparative study of time-domain and joint time-frequency-domain methods for ionospheric irregularity drift velocity estimation from a GNSS receiver array during high latitude ionospheric scintillation," *Int. Iono. Effects Sym.*, May 2017.
- C66. Breitsch, B., Y. Morton, "Joint estimation of ionosphere TEC, receiver inter-frequency biases, and carrier ambiguities using 3-frequency GPS measurements," *URSI National Radio Science Meeting*, Boulder, CO, Jan. 2017.
- C67. Jiao, Y., Hall, J., Y. Morton, "Automatic GPS phase scintillation detector using a machine learning algorithm," Proc. *ION ITM*, Monterey, CA, Jan. 2017.
- C68. Myer, G., Y. Morton, B. Schipper, "Ionospheric scintillation effects on GPS pseudorange and carrier phase measurements and an adaptive algorithm to limit position errors during scintillation," Proc. *ION ITM*, Monterey, CA, Jan. 2017.
- C69. Rino, C., J. Jiao, J. Morton, "Modeling scintillation for GPS and RO geometries," *Int. Sym. GNSS*, Dec. 2016.
- C70. Jiao, Y., D. Xu, Y. Morton, C. Rino, "Equatorial amplitude scintillation spectrum analysis and fading characteristics on GPS signals," Proc. *ION GNSS+*, Sept. 2016.
- C71. Jiao, Y., J. Hall, Y. Morton, "Performance evaluations of an equatorial GPS amplitude scintillation detector using a machine learning algorithm," Proc. *ION GNSS+*, Portland, OR, Sept. 2016. (*Best Paper Award*)
- C72. Xu, D., Y. Morton, "Beidou signal parameters characterization during strong equatorial ionospheric scintillation," Proc. *ION GNSS+*, Portland, OR, Sept. 2016. (*Invited*)
- C73. Bourne, H., Y. Morton, F. van Graas, M. Sulzer, M. Milla, "Gradient-based TEC estimation with code noise multipath correction evaluation using simultaneous incoherent scatter radar measurements," Proc. *ION ITM*, 140-150, Monterey, CA, May 2016.
- C74. Breitsch, B., J. Morton, "Distribution of common-volume LEO-based and ground-based GNSS ionosphere observations," Proc. *URSI Radio Science Meeting*, Boulder, CO, Jan. 2016.

- C75. Wang, J., Y. Morton, J. Spaleta, W. Bristow, "A comparative study of ionospheric irregularity drift velocity using a GNSS receiver array and SuperDARN at high latitude," *Proc. ION ITM*, Monterey, CA, Jan. 2016.
- C76. Jiao, Y., Y. Morton, "A comparative study of triple frequency GPS scintillation signal amplitude fading characteristics at low latitudes," *Proc. ION GNSS+*, Tampa, FL, Sept. 2015.
- C77. Wang, J., Y. Morton, "Spaced receiver array for ionospheric irregularity drift velocity estimation using multi-band GNSS signals," *Proc. ION GNSS+*, Tampa, FL, Sept. 2015.
- C78. Xu, D., Y. Morton, D. Akos, T. Walter, "GPS multi-frequency carrier phase characterization during strong equatorial ionospheric scintillation," *Proc. ION GNSS+*, Tampa, FL, Sept. 2015. (*Best Paper Award*).
- C79. Morton, Y., Y. Jiao, and S. Taylor, "High-latitude and equatorial ionospheric scintillation based on an event-driven multi-GNSS data collection system," *Proc. Ionospheric Effects Sym.*, Alexandria, VA, May 2015.
- C80. Bourne, H., Y. Morton, T. Nguyen, M. Sulzer, M. Milla, "GPS Based TEC estimation algorithm evaluation using simultaneous incoherent scatter radar measurements," *Proc. ION Pacific PNT*, Honolulu, HI, April 2015.
- C81. Liu, Z., Z. Yang, W. Chen, J. Morton, X. Ding, M. Aquino, A. Dodson, "A comparative analysis of GPS ionospheric scintillations observed in Northern and Southern equatorial anomaly regions in 2013-2014," *Proc. ION Pacific PNT*, Honolulu, HI, April 2015.
- C82. Morton, Y., Y. Jiao, F. van Graas, E. Vinande, N. Pujara, "Analysis of receiver multi-frequency response to ionospheric scintillation in Ascension Island, Hong Kong, and Singapore," *Proc. ION Pacific PNT*, Honolulu, HI, April 2015.
- C83. Xu, D., Y. Morton, "GPS carrier parameters characterization during strong equatorial ionospheric scintillation," *Proc. ION ITM*, Dana Point, CA, Jan. 2015.
- C84. Jiao, Y., Y. Morton, S. Taylor, M. Carroll, "Characteristics of low-latitude signal fading across the GPS frequency bands," *Proc. ION GNSS+*, Tampa, FL, Sept. 2014.
- C85. Marcus, R., J. Morton, R. Cole, Y. Morton, "Redblade: an autonomous snowplow," *Proc. ION GNSS+*, Tampa, FL, Sept. 2014.
- C86. Wang, J., Y. Morton, J. Spaleta, B. Bristow, "Spatial characterization of high latitude ionospheric scintillation using an array of software receiver measurements," *Proc. ION GNSS+*, Tampa, FL, Sept. 2014.
- C87. Yin, H., Y. Morton, M. Carroll, E. Vinande, "Implementation and performance analysis of a multi-frequency GPS signal tracking algorithm," *Proc. ION GNSS+*, Tampa, FL, Sept. 2014. (*Best Presentation Award*).
- C88. Morton, Y., H. Bourne, M. Carroll, Y. Jiao, N. Kassabian, S. Taylor, J. Wang, D. Xu, H. Yin, "Multi-constellation GNSS observations of equatorial ionospheric scintillation," *Proc. URSI General Assembly & Sci. Sym.*, Beijing, China, Aug., 2014. (*Invited*)
- C89. Wang, C., J. Wang, Y. Morton, "Regional ionospheric TEC gradients estimation using a single GNSS receiver," *Proc. Chinese Satellite Navigation Conference*, Nanjing, China, May 2014.
- C90. Jiao, Y., Y. Morton, S. Taylor, "Comparative studies of high-latitude and equatorial ionospheric scintillation," *Proc. IEEE/ION PLANS*, Monterey, CA, May 2014.
- C91. Carroll, M., Y. Morton, E. Vinande, "Triple frequency GPS signal tracking during strong ionospheric scintillations over Ascension Island," *Proc. IEEE/ION PLANS*, Monterey, CA, May 2014.
- C92. Han, B., G. Erry, K. Low, Y. Morton, "Simulation study of the effect of orbital errors on open loop tracking in GPS radio occultation," *Proc. IEEE/ION PLANS*, Monterey, CA, May 2014.
- C93. Kassabian, N., Y. Morton, "Extending integration time for Galileo tracking robustness under ionosphere scintillation," *Proc. IEEE/ION PLANS*, Monterey, CA, May 2014.
- C94. Cole, R., B. Jameson, D. Garmatyuk, Y. Morton, "Simultaneous indoor localization and detection with multi-carrier radar," *Proc. IEEE RadarCon*, Cincinnati, OH, May 2014.

- C95. Liu, Y., G. Y. Liang, D. Garmatyuk, Y. Morton, "USRP based OFDM radar systems for doorway detection," *Proc. IEEE RadarCom*, May 2014.
- C96. Xu, D., Y. Morton, S. Taylor, "Algorithms and results of tracking Beidou signals during strong ionospheric scintillation over Ascension Island," *Proc. ION ITM*, San Diego, CA, Jan. 2014.
- C97. Yin, H., Y. Morton, M. Carroll, E. Vinande, "GPS CNAV signal decoding and performance comparison with legacy navigation messages," *Proc. ION ITM*, San Diego, CA, Jan. 2014.
- C98. Kassabian, N., Y. Morton, "Galileo tracking performance under ionosphere scintillation," *4<sup>th</sup> Int. Colloquium Sci. Fundamental Aspects Galileo Prog.*, Oct. 2013. (Best Paper Award)
- C99. Jiao, Y., Y. Morton, S. Taylor, W. Pelgrum, "Correlation between ionosphere scintillation and geomagnetic field activities," *Proc. ION GNSS+*, Nashville, TN., Sept. 2013.
- C100. Kauffman, K., J. Raquet, Y. Morton, D. Garmatyuk, "Experimental study of two-channel UWB-OFDM radar for indoor navigation with INS integration," *Proc. ION GNSS+*, Nashville, TN, Sept. 2013.
- C101. Mao, X., Y. Morton, "GNSS receiver carrier tracking loop designs for robust navigation application and for ionosphere studies," *Proc. ION GNSS+*, Nashville, TN., Sept. 2013.
- C102. Wang, C., Y. Morton, "Estimation of total electron content gradient using a regional GNSS network," *Proc. ION GNSS+*, Nashville, TN, Sept. 2013.
- C103. Wang, J., Y. Morton, Q. Zhou, W. Pelgrum, "Quantitative spectrum analysis of high latitude and equatorial ionosphere scintillation," *Proc. ION GNSS+*, Nashville, TN., Sept. 2013.
- C104. Jameson, B., D. Garmatyuk, Y. Morton, "Reconnaissance using adaptive multi-carrier radar with experimentally identified disturbance statistics," *Proc. IEEE RadarCon*, Ottawa, Canada, May 2013.
- C105. Jameson, B., D. Garmatyuk, Y. Morton, K. Kauffman, R. Ewing, "Adaptive SAR imaging of indoor environments using software-defined UWB OFDM sensor," *Proc. IEEE RadarCon*, Ottawa, Canada, May 2013.
- C106. Bourne, H., Y. Morton, "GPS receiver ionosphere error correction based on spatial gradients and IGS satellite DCBs," *Proc. ION Pacific PNT*, Honolulu, HI, Apr. 2013.
- C107. Liu, Z., R. Xu, Y. Morton, J. Xu, W. Pelgrum, S. Taylor, W. Chen, X. Ding, "A comparison of GNSS-based ionospheric scintillation observations in north and south Hong Kong," *Proc. ION Pacific PNT*, Honolulu, HI, Apr. 2013.
- C108. Park, J., J. Helmboldt, D. Grejner-Brzezinska, R. von Frese, J. Morton, T. Wilson, "On detecting underground nuclear explosions with GNSS and radio astronomical observations," *Proc. ION Pacific PNT*, 52-61, Honolulu, Hawaii, Apr. 2013.
- C109. Taylor, S., Y. Morton, R. Marcus, H. Bourne, W. Pelgrum, A.J. Van Dierendonck, "Ionospheric scintillation receivers performances based on high latitude experiments," *Proc. ION Pacific PNT*, Honolulu, HI, Apr. 2013.
- C110. Vinande, E., N. Pujara, Y. Morton, R. Marcus, F. van Graas, W. Pelgrum, "International collaborative navigation research," *Proc. ION Pacific PNT*, Honolulu, HI, Apr. 2013.
- C111. Wang, J., Y. Morton, Q. Zhou, W. Pelgrum, "High latitude and equatorial ionosphere scintillation spectrum analysis," *Proc. ION Pacific PNT*, Honolulu, HI, Apr. 2013.
- C112. Di, R., Y. Morton, E. Vinande, "Performance analysis of a USRP-based GPS and GLONASS signal recording and playback system," *Proc. ION ITM*, San Diego, CA, Jan. 2013.
- C113. Jiao, Y., Y. Morton, S. Taylor, W. Pelgrum, "High latitude ionosphere scintillation characterization," *Proc. ION ITM*, San Diego, CA, Jan. 2013.
- C114. Kauffman, K., J. Raquet, Y. Morton, D. Garmatyuk, "Experimental study of UWB-OFDM SAR for indoor navigation with INS integration," *Proc. ION GNSS*, Nashville, TN, Sept. 2012.
- C115. Niu, F., Y. Morton, W. Pelgrum, A. J. Van Dierendonck, "Performances of GPS signal observables detrending methods for ionosphere scintillation studies," *Proc. ION GNSS*, Nashville, TN, Sept. 2012.

- C116. Park, J., D. Grejner-Brzezinska, R. von Freese, Y. Morton, "Discriminating underground nuclear explosions and earthquakes in GPS-detected traveling ionosphere disturbances: case study," *Proc. ION GNSS*, Nashville, TN, Sept. 2012.
- C117. Peng, S., Y. Morton, W. Pelgrum, "Ionosphere scintillation signal parameter modeling based on triple frequency software GNSS receiver measurements," *Proc. ION GNSS*, Nashville, TN, Sept. 2012.
- C118. Wang, J., Y. Morton, Q. Zhou, W. Pelgrum, "Spatial characterization of high latitude ionosphere scintillations," *Proc. ION GNSS*, Nashville, TN, Sept. 2012.
- C119. Jameson, B., D. Garmatyuk, Y. Morton, "Cognitive radar for indoor positioning with a software-defined UWB OFDM radar," *Proc. IEEE RadarCon*, Atlanta, GA, May 2012.
- C120.
- C121. Di, R., Y. Morton, S. Peng, "A USRP-based GNSS and interference signal generator and playback system," *Proc. IEEE PLANS*, Myrtle Beach, SC, April 2012.
- C122. Peng, S., Y. Morton, R. Di, "A multiple-frequency GPS software receiver design based on a vector tracking loop," *Proc. IEEE PLANS*, Myrtle Beach, SC, April 2012.
- C123. Wang, J., Y. Morton, Q. Zhou, F. van Graas, W. Pelgrum, "Time-frequency analysis of ionosphere scintillation observed by a GNSS receiver array," *Proc. IEEE PLANS*, Myrtle Beach, SC, Apr. 2012. (*Best Paper in Track*)
- C124. Niu, F., Y. Morton, J. Wang, W. Pelgrum, "GPS carrier phase detrending methods and performances for ionosphere scintillation studies," *Proc. ION ITM*, Newport Beach, CA, Feb. 2012.
- C125. Park, J., D. Grejner-Brzezinska, R. von Freese, Y. Morton, L. Gaya-Pique, "On using traveling ionospheric disturbances to detect underground nuclear tests," *Proc. ION ITM*, Newport Beach, CA, Feb. 2012.
- C126. Taylor, S., Y. Morton, Y. Jiao, J. Triplett, W. Pelgrum, "An improved ionosphere scintillation event detection and automatic trigger for a GNSS data collection system," *Proc. ION ITM*, Newport Beach, CA, Feb. 2012.
- C127. Jameson, B., D. Garmatyuk, Y. Morton, A. Curtis, "Target scene reconstruction in indoor environment with cognitive OFDM radar," *Proc. Int. Waveform Diversity & Design Conf.*, Kauai, HI, Jan. 2012. (*Second Place Student Paper Competition*)
- C128. Peng, S., Y. Morton, W. Pelgrum, F. van Graas, "High latitude ionosphere scintillations at L5 band," *Proc. ION GNSS*, Portland, OR, Sept. 2011.
- C129. Wolfarth, R., S. Taylor, A. Wibowo, B. Williams, Y. Morton, P. Jamieson, "Redblade: Miami University's multi-functional autonomous robot," *Proc. ION GNSS*, Portland, OR, Sept. 2011.
- C130. Zhang, L., Y. Morton, "GPS carrier phase and carrier phase spectrum estimation for ionosphere scintillation studies," *Proc. ION GNSS*, Portland, OR, Sept. 2011.
- C131. Pelgrum, W., Y. Morton, F. van Graas, P. Vikram, S. Peng, "Multi-domain analysis of the impact on natural and man-made ionosphere scintillations on GNSS signal propagation," *Proc. ION GNSS*, Portland, OR, Sept. 2011. (*Best Presentation Award*)
- C132. Vikram, P., Y. Morton, W. Pelgrum, "Event driven data collection system for studying ionosphere scintillation," *Proc. ION GNSS*, Portland, OR, Sept. 2011.
- C133. Wang, J., J. Morell, Y. Morton, "Predicting GLONASS satellite orbit based on an almanac conversion algorithm for controlled ionosphere scintillation experiment planning," *Proc. ION GNSS*, Portland, OR, Sept. 2011.
- C134. Curtis, A., D. Garmatyuk, Y. Morton, R. Ewing, "Improved target detection through OFDM radar signal's frequency analysis," *Proc. NAECOM*, Dayton, OH, July 2011.
- C135. Kauffman, K., J. Raquet, Y. Morton, D. Garmatyuk, "Enhanced feature detection and tracking algorithm for UWB-OFDM SAR navigation," *Proc. NAECOM*, Dayton, OH, July 2011. (*Best Paper Award*)

- C136. Jameson, B., A. Curtis, D. Garmatyuk, Y. Morton, P. Plummer, K. Thompson, "Detection of behind-the-wall targets with adaptive UWB OFDM radar: experimental approach," *Proc. IEEE RadarCon*, Kansas City, KS, May 2011.
- C137. Kauffman, K., J. Raquet, Y. Morton, D. Garmatyuk, "Simulation study of UWB-OFDM SAR for navigation with INS integration," *Proc. ION ITM*, San Diego, Jan. 2011.
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