

PUBLICATIONS

Articles in Refereed Journals: Published or Accepted

Student names (or postdoctoral fellows) are followed by *.

- [1] El-Darymli* K, Gill E W, McGuire P, Power D, Moloney C. (2015). Unscrambling Nonlinear Dynamics in Synthetic Aperture Radar Imagery. *IEEE Access*, <http://dx.doi.org/10.1109/ACCESS.2015.2412132>.
- [2] El- Darymli* K, McGuire P, Gill E W, Power D, Moloney C. (2015). Characterization and Statistical Modeling of Phase in Single-channel Synthetic Aperture Radar Imagery. *IEEE Transactions on Aerospace and Electronic Systems*, accepted.
- [3] Wang* W, Gill E W. (2015). High-resolution Spectral Estimation of HF Radar Data for Current Measurement Applications. *American Geophysical Union Journal of Atmospheric and Oceanic Technology*, accepted.
- [4] An* J, Huang W, Gill E. (2015). A Self-Adaptive Wavelet-Based Algorithm for Wave Measurement Using Nautical Radar. *IEEE Transactions on Geoscience and Remote Sensing*. 53(1): 567-577.
- [5] Liu* Y, Huang W, Gill E W, Peters D, Vicen-Bueno R. (2015). Comparison of Algorithms for Wind Parameters Extraction from X-band Shipborne Marine Radar Images. *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*. 8(2): 896-906.
- [6] Huang W, Gill E, An* J. (2014). Iterative Least-squares-based Wave Measurement Using X-band Nautical Radar. *IET Radar, Sonar and Navigation*. 8(8): 853-863.
- [7] Shen* C, Gill E, Huang W. (2014). HF Radar Cross Sections of Swell Contaminated Seas for a Pulsed Waveform. *IET Radar, Sonar and Navigation*. 8(4): 382-395.
- [8] El-Darymli* K, McGuire P, Gill E, Power D, Moloney C. (2014). The Effect of Detection on Spatial- Resolution in SAR Imagery, and Mitigation through Upsampling. *Journal of Applied Remote Sensing*. 8(1)
- [9] Walsh J, Huang W, Gill E. (2013). The Second-order High Frequency Radar Ocean Surface Foot- scatter Cross Section for an Antenna on a Floating Platform. *IEEE Transactions on Antennas and Propagation*. 61(11): 5833-5838.
- [10] Huang W, Gill E, Wu X, Li L. (2012). Measurement of Sea Surface Wind Direction Using Bistatic High- Frequency Radar. *IEEE Transactions on Geoscience and Remote Sensing*. 50(10): 4117-4122.
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- [12] Huang W, Gill E. (2012). Surface Current Measurement under Low Sea State Using Dual Polarized X-band Nautical Radar (JSTARS). *IEEE Journal Selected Topics in Applied Earth Observation and Remote Sensing (JSTARS)*. 5(6): 1868-1873.

- [13] Zhang* J, Walsh J, Gill E. (2012). Inherent Limitations in High Frequency Radar Remote Sensing Based on Bragg Scattering from Gaussian Rough Surfaces. *IEEE Journal of Oceanic Engineering*. 37(4):395-406.
- [14] Walsh J, Zhang* J, Gill E. (2011). High Frequency Radar Cross Section of the Ocean Surface for an FMCW Waveform. *IEEE Journal of Oceanic Engineering*. 36(4): 615-626.
- [15] Gurgel K, Dzvonkovskaya A, Pohlmann T, Schlick T, Gill E. (2011). Simulation and Detection of Tsunami Signatures in Ocean Surface Currents Measured by HF Radar. *Ocean Dynamics*. 61(10): 1495-1507.
- [16] Walsh J, Huang W, Gill E. (2010). The First-order High Frequency Radar Ocean Surface Cross Section for an Antenna on a Floating Platform. *IEEE Transactions on Antennas and Propagation*. 58(9): 2994-3003.
- [17] Green* D, Gill E, Huang W. (2009). An Inversion Method for Extraction of Wind Speed from High-Frequency Ground-Wave Radar Oceanic Backscatter. *IEEE Transactions on Geoscience and Remote Sensing*. 47(10): 3338-3346.
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- [21] Zhang* J, Gill E. (2006). Extraction of Ocean Wave Information from Simulated Noisy High Frequency Bistatic Radar Data. *IEEE J. Oceanic Eng. Special Issue on HF/VHF Sea Surface Radar*, Vol.31, No. 4, pp. 779-796. (Invited paper).
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Submitted or In Preparation for Submission to Refereed Journals

- [31] El-Darymli* K, McGuire P, Gill E W, Power D, Moloney C. (2014). Holism for Target Classification in Synthetic Aperture Radar Imagery. *IEEE Transactions on Aerospace and Electronic Systems*, submitted.
- [32] Shen* C, Huang W, Gill E W, Carrasco R, Horstmann J. (2015). An Algorithm for Surface Current Retrieval from X-band Marine Radar Images. *Remote Sensing*, submitted.
- [33] Huang W, Carrasco R, Shen C, Gill E W, Horstmann J. (2015) Surface Current Measurements Using X-band Marine Radar with Vertical Polarization. *IEEE Trans. Geoscience and Remote Sensing*, submitted.
- [34] Walsh J, Gill E W, Huang W, Chen*, S. (2015) On the Development of a High Frequency Radar Cross Section for Ionosphere-ocean Propagation, *IEEE Trans. Antennas Propagation*. (Under second review)
- [35] Chen* S, Huang W, Gill E W. (2015). A vertical reflection ionospheric clutter model for high frequency radar used in coastal remote sensing, *IEEE Antenna and Wireless Propagation Letters*, submitted.

Book Chapters

- [1] Huang W, Gill E W. (2015). Ocean Remote Sensing Using X-band Shipborne Nautical Radar - Applications in Eastern Canada" to the Elsevier book "Coastal Ocean Observing Systems: Advances and Syntheses. Liu Y, Kerkering H, Weisberg R H.

Publishing Company: Elsevier. , and R.H. Weisberg. Coastal Ocean Observing Systems: Advances and Syntheses, accepted.

Reports

- [1] Hart D, Power D, Green D, Macneill A, Gill E W, Kidney B, Norga*, M. (2013). Assessment of HF Radar for Significant Wave Height Determination, Report R-13-109-1037. 36. C-CORE. [\$50k]
- [2] Zhang* J, Gill E W. (2008). Application of High Frequency Radar Models to the Problem of Early Warning for Tsunamis. 34. Helzel, Messtechnik GmbH. [\$26.6k]
- [3] Hickey K, Gill E W, Walsh J, Khan R. (1993). Ocean Surface Parameter Data from the Northern Radar Cape Race Ground Wave Radar System, Contract Report, Northern Radar Systems Limited, 93-C5.
- [4] Hickey K., Gill E W, Walsh J, Dawe B J. (1992). Results of the Surface Current and Waves Measurement Program Using the Northern Radar Cape Race Ground Wave Radar System, Contract Report for Dept. of Fisheries and Oceans, Northwest Atlantic Fisheries Centre, St. John's, Canada.

Refereed International and National Conferences: Published or Accepted

- [1] Chen* S, Huang W, Gill E W. (2015). A Vertical Reflection Ionospheric Clutter Model for High Frequency Surface Wave Radar, *IEEE International Symposium on Antennas and Propagation*. Vancouver, Canada. (accepted)
- [2] Huang W, Gill E W. (2015). Retrieving Wind Speed from Rain-Contaminated X-band Nautical Radar Images. *IEEE 5th International Conference on Information Science and Technology*. Changsha, China, accepted.
- [3] Liu* X, Huang W, Gill E W. (2015). Shadowing-Analysis-Based Wave Height Measurement from Ship-Borne X-Band Nautical Radar Images. *MTS/IEEE Oceans*, Genova, Italy, accepted.
- [4] Ma* Y, Gill E W, Huang W. (2015). The First-Order Bistatic High Frequency Radar Scattering Cross Section of the Ocean Surface for the Case of Floating Platform. *MTS/IEEE Oceans*, Italy, (invited paper), accepted.
- [5] Wang* W, Gill E W. (2015). Calibration of the Effect of Sampling Jitter on Wind Direction Measurement from Platform-based HF Radar. *MTS/IEEE Oceans*, Italy, accepted.
- [6] Al-Habashneh* A, Moloney C, Gill E W. (2015). A Hybrid Method for Surface Current Estimation Using X-band Nautical Radar. *International Radar Symposium*, Dresden, Germany, accepted.

- [7] Liu* X, Huang W, Gill E W. (2015). Wave Height Estimation from Ship-Borne X-Band Nautical Radar Images. *36th Canadian Symposium on Remote Sensing*, Newfoundland, Canada, (abstract ref.), accepted.
- [8] Ma* Y, Gill E W, Huang W. (2015). Comparison of Antenna-Motion-Incorporated High Frequency Bistatic Radar Cross Sections of the Ocean Surface with Earlier Models. *36th Canadian Symposium on Remote Sensing*, Newfoundland, Canada, (abstract ref.), accepted.
- [9] Chen* S, Gill E W, Huang W. (2015). An Ionospheric Reflection Coefficient Model for HF Ionosphere-Ocean Propagation. *36th Canadian Symposium on Remote Sensing*, Newfoundland, Canada, (abstract ref.), accepted.
- [10] Wang* W, Gill E W. (2015). *36th Canadian Symposium on Remote Sensing*, Newfoundland, Canada, (abstract ref.), accepted.
- [11] El-Darymli* K, Hansen* N, Gill E W. (2015). Design and Implementation of a High-Frequency Software-Defined Radar (HF-SDR): Initial Results. *36th Canadian Symposium on Remote Sensing*, Newfoundland, Canada, (abstract ref.), accepted.
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- [14] Al-Habashneh* A, Moloney C, Gill E W. (2014). Performance of the Polar Fourier Transform for Ocean Wave Spectrum Estimation from Marine Radar. *Oceans 2014 MTS/IEEE*, St. John's, Newfoundland, Canada, Sept. 14-19.
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- [17] Gill E W, Huang W. (2014). A Review of the Continuing Evolution of Coastal Ocean Radar Remote Sensing in the Eastern Canadian Context. *Oceans 2014 MTS/IEEE*, St. John's, Newfoundland, Canada, Sept. 14-19.

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- [19] Wang* W, Gill E W. (2014). Comparison of Spectral Estimation Methods for Current Estimation by an HF Surface Wave Radar. *Oceans 2014 MTS/IEEE*, St. John's, Newfoundland, Canada, Sept. 14-19.
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- [24] Liu* Y, Huang W, Gill E W. (2014). Intensity-level-selection-based Wind Retrieval from Shipborne Nautical X-band Radar Data. *IEEE International Geoscience and Remote Sensing Symposium*, Quebec, Canada, July 13-18.
- [25] Shen* C, Huang W, Gill E W. (2014). An Alternative Method for Surface Current Extraction from X-band Marine Radar Images, *IEEE International Geoscience and Remote Sensing Symposium*, Quebec, Canada, July 13-18.
- [26] El-Darymli* K, McGuire P, Gill E, Power D, Moloney C. (2014). Understanding the Significance of Radiometric Calibration for Synthetic Aperture Imagery. *Canadian Conference on Electrical and Computer Engineering*, Toronto, Ontario, May 4-7.
- [27] Ryan* B, Gill E W. (2014). An Analysis of the Backscattered Electric Field from an Iceberg for a Pulsed High Frequency Radar, *Canadian Conference on Electrical and Computer Engineering*, Toronto, Ontario, May 4-7.
- [28] Wang* W, Gill E W, Huang W. (2014). High-resolution Spectral Estimation of HF Radar Data for Current Measurement Applications. *The 2nd Ocean Radar Conference for Asia-Pacific*, Kaohsiung, Taiwan, April 2-4.

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- [30] Liu* Y, Huang W, Gill E W. (2014). Dual-Curve-Fitting Based Wind Retrieval from Shipborne Nautical X-Band Radar Data. *Oceans 2014 MTS/IEEE*, Taipei, Taiwan, April 7-10.
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- [45] Huang W, Gill E. (2011). Extraction of Sea Surface Wind Direction from Bistatic High-Frequency Radar Doppler Spectra, *Oceans'11. IEEE Conference and Exhibition*, Hawaii, USA, Sept 19-22. (Extended abstract review)
- [46] Huang W, Gill E. (2011). Sea Surface Current Measurements at Long Range using Lower-band High-Frequency Radar. *Oceans'11, IEEE Conference and Exhibition*, Santander, Spain, June 6-9. (Extended abstract review)
- [47] Walsh J, Ryan* B, Gill E, El Khoury J. (2010). Further Analysis of the Modulation of High Frequency Radar Spectra due to Sea-induced Antenna Platform Motion. *Oceans'10, IEEE Conference and Exhibition*, Sydney, Australia, May 24-27. (Extended abstract review)
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- [50] Heron M L, Gill E W, Prytz A. (2008). An investigation of double-peaked HF radar spectra via a convolution/de-convolution algorithm. *Oceans'08, MTS/IEEE Conference and Exhibition*, Kobe, Japan, pp. 1-4, April 8-11. (Extended abstract review)
- [51] Walsh J, Gill E, Huang* W. (2008). A Monostatic Ocean Scattering Cross Section for the Case of Surface Wave Radar Operating from a Floating Barge. *Oceans'08*,

- MTS/IEEE Conference and Exhibition, Kobe, Japan, pp. 1-4, Apr 8-11. (Extended abstract review)*
- [52] Walsh, J, Gill E W, Huang W. (2008). On the Problem of Antenna Platform Motion for High Frequency Surface Wave Radar Applications. *Canadian Conference on Electrical and Computer Engineering*, Niagara Falls, Ontario, pp. 471-474, May 4-7. (Full-paper review)
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- [54] Churchill* S, Randell C, Gill E, Power D. (2006). Data Fusion: Cumulative Effects of Discrete Fusion on Target Detection Probability. *Proc. International Geoscience and Remote Sensing Symposium (IGARSS'06)*, Denver, Colorado. (Extended abstract review)
- [55] Zhang* J, Gill E W, Walsh J. (2006). Variability of High Frequency Sea Echo Based on the Random Phase Content of the Electric Field Equations for a Pulsed Dipole Source. *Proc. AGU Ocean Sciences Mtg.*, Honolulu, USA. (Refereed Abstract)
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- [57] Churchill* S, Randell C, Power D, Gill E. (2004). Data Fusion: Remote Sensing for Target Detection and Tracking. *Proc. International Geoscience and Remote Sensing Symposium (IGARSS'04)*, Anchorage, Alaska. (Extended abstract review)
- [58] Sircar* S, Power D, Randell C, Youden J, Gill E. (2004). Lateral and Subsidence Movement Estimation Using INSAR. *Proc. International Geoscience and Remote Sensing Symposium (IGARSS'04)*, Anchorage, Alaska.
- [59] Gill, E.W., Huang* W, Zhang* J. (2003). An Alternate Analysis for the Second-Order High Frequency Bistatic Radar Cross Section of the Ocean Surface – Patch Scatter and its Inversion. *Proc. Oceans 2003*, San Diego, Calif. (Invited Paper).
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- [63] Zhang* J, Gill E W. (2003). The Inversion of HF Bistatic Doppler Radar Spectra for Arbitrary Water Depth – A Simulation. *Proc. Canadian Meteorological and Oceanic Society Symp.*, Ottawa, Canada.
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- [68] Gill E W, Walsh J. (2001). A Relationship Between External Noise and the Ocean Clutter Models for Bistatic Operation of Pulsed High-Frequency Radar, *Proc. IEEE Canadian Conference on Electrical and Computer Engineering*, Toronto, ON, Canada.
- [69] Gill E W, Walsh J. (1999). The Scattering of High Frequency Ground Wave Radiation from Highly Conducting Surfaces with Emphasis on Bistatic Reception. *Proc. of the XXVIth General Assembly of the International Union of Radio Science*, Toronto, Ontario, Canada.
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- [75] Dobson F W, Smith S D, Anderson R J, Vachon P W, Vandemark D, Buckley J R, Allingham M, Khandekar M, Lalberharry R, Gill E. (1992). The Grand Banks ERS-1 SAR Wave Spectra Validation Experiment. *Proc. European Space Agency ERS-1 Symposium*, Cannes, France, 1992.
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Radiowave Oceanography Workshop Contributions

This is an international 4-day workshop of 35 to 40 HF radar experts and users (mainly physicists and engineers) where the latest models and applications of the science and technology associated with the remote sensing of the oceans via HF radar, as well as required research directions, are discussed. While it is **not a 'refereed'** workshop, it is probably the single most important venue for the dissemination of research expertise in this field and input is invited from a small group of experts. Our group at Memorial University is among a minority of participants who are deeply involved with the basic and applied science underlying the technology. **Student and Post-doctoral fellow names in bold from here on.**

- [77] **Wang* W**, Gill E W, **Ryan* B**. (2014). A Combined Beamforming/Direction Finding Scheme for Phased Arrays and Other Recent Developments, *Radiowave Oceanography 12th International Workshop*, Savannah, Georgia, USA, May 11-15.
- [78] **Norga* M**, **Shen* C**, Gill E, Huang W. (2012). Scattering of High Frequency Electromagnetic Radiation in a Noisy Environment and Simulation of HF Radar Cross Sections for Swell Contaminated Seas, *Radiowave Oceanography 11th International Workshop*, Toulon, France, Apr 17-19. (Invited Presentation).
- [79] Walsh, J., **J. Zhang**, and E. Gill, Ocean Cross Section Characteristics for FMCW Waveforms, *Radiowave Oceanography 10th International Workshop*, Mount Hood, Oregon, USA, Sept 26-29, 2010. (Invited Paper).
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- [87] **Y. Ma**, E. W. Gill, and W. Huang, "**A Review of High Frequency Radar Cross Section of the Ocean Surface**," IEEE NECEC Conference, Newfoundland, Canada, 2014.
- [88] **S. Chen**, E. W. Gill, and W. Huang, "**An Ionospheric Reflection Coefficient Model for Mixed-path Ionosphere-Ocean Propagation of High Frequency Radio Waves**," IEEE NECEC Conference, Newfoundland, Canada, 2014. (Wally Read Best Student Paper Award)
- [89] **Liu* Y**, Huang W, Gill E. (2013). Wind Direction Retrieval From Shipborne Nautical X-Band Radar Data. *NECEC*, St. John's, Newfoundland, Nov. 7.
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* The **Governor-General's Gold Medal** is a University-wide honour awarded for the highest academic standing in the doctoral program.

** The **Dunsiger Award for Thesis Excellence** is the highest honour of the Faculty of Engineering and Applied Science awarded for excellence in graduate studies.