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## Hurricane Imaging Radiometer

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### PUBLICATIONS

#### Journals (Science)

Ruba Amarin, Christopher Ruf, W. Linwood Jones, "Impact of Spatial Resolution on Wind Field Derived Estimates of Air Pressure Depression in the Hurricane Eye", *Molecular Diversity Preservation International Journal (MDPI)*, Volume 2, Issue 3, PP 611-907, March 2010.

El-Nimri, Salem F., W. Linwood Jones, Eric Uhlhorn, Christopher Ruf, James Johnson, and Peter Black, "An Improved C-Band Ocean Surface Emissivity Model at Hurricane-Force Wind Speeds over a Wide Range of Earth Incidence Angles", *IEEE Geosci. & Remote Sens. Letters*, Vol. 7, no. 4, pp. 641-645, Oct 2010.

Ruba A. Amarin, W. Linwood Jones, James Johnson, Christopher Ruf, Timothy Miller, Eric Uhlhorn, "Hurricane Wind Speed and Rain Rate Measurements Using the Airborne Hurricane Imaging Radiometer (HIRAD)," *IEEE Trans. Geo and Remote Sens.*

#### Journals (Engineering)

Bailey, M. C., Ruba Amarin, James Johnson, Paul Nelson, Mark James, David Simmons, Christopher Ruf, Linwood Jones and Xun Gong, "Multi-Frequency Synthetic Thinned Array Antenna for the Hurricane Imaging Radiometer", *IEEE Trans. Ant. & Prop.*, vol – 58, no. 8, pp. 2562-2570, Aug 2010.

#### Published Abstracts (Science)

Johnson, James W., Amarin, Ruba A., El-Nimri, Salem F., and W. Linwood Jones, "A Wide Swath, Imaging Microwave Radiometer for Hurricane Observations", 60th InterDepartmental Hurricane Conference, Mobile, AL, Mar. 21-24, 2006

El-Nimri, Salem F., Johnson, James W. and W. Linwood Jones, "Signal Analysis of Microwave Radiometric Emissions in Hurricanes: Part 1- Ocean Wind Speed Dependence", Proc. IEEE SoEastCon, Memphis, TN, Mar. 31-Apr. 1, 2006

Amarin, Ruba A., Johnson, James and W. Linwood Jones, "Signal Analysis of Microwave Radiometric Emissions in Hurricanes: Part 2 – Oceanic rain Rate Dependence", Proc. IEEE SoEastCon, Memphis, TN, Mar. 31-Apr. 1, 2006

Johnson, James W., Amarin, R. A., El-Nimri, Salem F., and W. Linwood Jones "A Wide-Swath, Hurricane Imaging Radiometer for Airborne Operational Measurements", Proc. IEEE IGARSS-06, Aug. 28 - Sept. 1, 2006, Denver, CO.

Robbie Hood, R. Amarin, M. Bailey, P. Black, M. James, J. Johnson, L. Jones, B. Lim, C. Ruf, K. Stephens, and V. Rohwedder, "Development of the Hurricane Imaging Radiometer (HIRAD) Using a Systems Engineering Approach", 61st Interdepartmental Hurricane Conference, March 5-9, 2007, New Orleans, LA.

Salem F. El-Nimri, James W. Johnson and W. Linwood Jones, and Eric W. Uhlhorn, "Development of an Ocean Surface Emissivity Model for Wide Swath Imaging of Wind Speed to Hurricane Force", Proc. IEEE IGARSS-07, Jul. 23 - 27, 2007, Barcelona, Spain.

T. L. Miller, R. Atlas, P. G. Black, J. L. Case, S. S. Chen, R. E. Hood, J. W. Johnson, L. Jones, C. S. Ruf, and E. W. Uhlhorn, "Simulation of the impact of new aircraft and space-based ocean surface wind measurements on H\*Wind analyses," 12th Conference on IOAS-AOLS, AMS Annual Meeting, Jan. 2008.

W. Linwood Jones, P.G. Black, S.S. Chen, R.E. Hood, J.W. Johnson, C.S. Ruf, A. Mins and C.C. Hennon, "Next Generation Airborne Hurricane Imaging Radiometer (HIRad) - Improved Forecast Skill with Wide Field Imagery," Spec. Symp. Hurr. and Trop. Meteorology, 88th AMS annual meeting, Jan. 20-22, 2008 New Orleans, LA.

Peter G. Black, E.W. Uhlhorn, J.F. Gamache, R.D. Knabb, J. Carswell, P.S. Chang, S. Lorsolo, R.E. Hood, L. Jones, I. PopStefanija and A.S. Goldstein, "Physical processes associated with surface wind field uncertainty in Hurricanes Katrina and Rita (2005): Use of present and future observational tools," Spec. Symp. Hurr. and Trop. Meteorology, 88th AMS annual meeting, Jan. 20-22, 2008 New Orleans, LA.

Timothy Miller, Robert Atlas, Peter Black, Jonathan Case, Shuyi Chen, Robbie Hood, James Johnson, Linwood Jones, Chris Ruf, Joe Terry, and Eric Uhlhorn, "Simulation of the Impact of New Aircraft-Based Ocean Surface Wind Measurements on H\*Wind Analyses," AMS 12th Conf. on IOAS-AOLS, 88th AMS annual meeting, Jan. 20-22, 2008 New Orleans, LA.

Salem El-Nimri, S. Al-Sweiss, J. W. Johnson, W. L. Jones, J. Byrd, L. Saporito, and C. S. Ruf, "Improved microwave remote sensing of hurricane wind speed and rain rates using the Hurricane Imaging Radiometer (HIRAD)," AMS 28th Conference on Hurricanes and Tropical Meteorology, Apr. 28 – May 2, 2008, Orlando, FL.

Timothy L. Miller, R. Atlas, P. Black, S. S. Chen, C. C. Hennon, R. Hood, J. W. Johnson, L. Jones, C. S. Ruf, and E. W. Uhlhorn, "Simulation of the impact of new ocean surface wind measurements on H\*Wind analyses," AMS 28th Conference on Hurricanes and Tropical Meteorology, Apr. 28 – May 2, 2008, Orlando, FL.

Robbie E. Hood, R. Atlas, P. Black, S. S. Chen, C. C. Hennon, J. W. Johnson, L. Jones, T. L. Miller, C. S. Ruf, and E. W. Uhlhorn, "An overview of the Hurricane Imaging Radiometer (HIRAD)," AMS 28th Conference on Hurricanes and Tropical Meteorology, Apr. 28 – May 2, 2008, Orlando, FL.

Ruba Amarin, C. S. Ruf, L. Jones, J. W. Johnson, and S. S. Chen, "Improved microwave radiometric imaging of surface wind speed dynamics in the hurricane eye-wall," AMS 28th Conference on Hurricanes and Tropical Meteorology, Apr. 28 – May 2, 2008, Orlando, FL.

Salem El-Nimri, Suleiman AlSweiss, W. Linwood Jones, James Johnson and Eric Uhlhorn, "Hurricane Imaging Radiometer Wide Swath Simulation for Wind Speed and Rain Rate", Proc. IEEE IGARSS-08, Jul. 6 - 11, 2008, Boston, MA.

Hood,Robbie Robert Atlas, M. C. Bailey, Peter Black, Mark James, James Johnson, Linwood Jones, Timothy Miller, Christopher Ruf, and Eric Uhlhorn, "Potential of Future Hurricane Imaging Radiometer (HIRAD) Ocean Surface Wind Observations for Determining Tropical Storm Vortex Intensity and Structure", Amer. Geophys Union Fall Meeting, Dec. 17, 2008, San Francisco, CA.

T. L. Miller, R. Atlas, P. G. Black, S. S. Chen, C. C. Hennon, R. E. Hood, J. W. Johnson, L. Jones, C. S. Ruf, and E. W. Uhlhorn, "Simulation of the impact of new ocean surface wind measurements on H\*Wind analyses," 28th Conference on Hurricanes and Tropical Meteorology, Orlando, Apr-May 2008.

R. E. Hood, R. Atlas, P. G. Black, S. S. Chen, C. C. Hennon, J. W. Johnson, L. Jones, T. L. Miller, C. S. Ruf, and E. W. Uhlhorn, "An overview of the Hurricane Imaging Radiometer (HIRAD)," 28th Conference on Hurricanes and Tropical Meteorology, Orlando, Apr-May 2008.

Amarin, R., C. S. Ruf, L. Jones and S. S. Chen, "Improved microwave radiometric imaging of surface wind speed dynamics in the hurricane eye-wall," Proc. 28th Conf. on Hurricanes and Tropical Metro., Orlando, FL, 28 Apr-2 May 2008.

El-Nimri, S., S. Al-Sweiss, R. Amarin, W. L. Jones and C. S. Ruf, "Improved microwave remote sensing of hurricane wind speed and rain rates using the Hurricane Imaging Radiometer (HIRAD)," Proc. 28th Conf. on Hurricanes and Tropical Metro., Orlando, FL, 28 Apr-2 May 2008.

Ruf, C. S., A. M. Mims and C. C. Hennon, "The dependence of the microwave emissivity of the ocean on hurricane force wind speed," Proc. 28th Conf. on Hurricanes and Tropical Metro., Orlando, FL, 28 Apr-2 May 2008.

R. E. Hood, R. Atlas, M. C. Bailey, P. Black, M. James, J. Johnson, L. Jones, T. Miller, C. Ruf, and E. Uhlhorn, "Potential of Future Hurricane Imaging Radiometer (HIRAD) Ocean Surface Wind Observations for Determining Tropical Storm Vortex Intensity and Structure," with Robbie Hood and others, AGU Fall Meeting, December 2008, San Francisco.

Miller, Timothy, Robert Atlas, Peter Black, Courtney Buckley, Shuyi Chen, Robbie Hood, James Johnson, Linwood Jones, Chris Ruf, Eric Uhlhorn, T. N. Krishnamurti, and Ceres Albers, "Simulation of the Impact of New Aircraft- and Satellite-Based Ocean Surface Wind Measurements on H\*Wind Analyses and Numerical Forecasts", AMS 13th Conference on Integrated Observing and Assimilation Systems for Atmosphere, Oceans, and Land Surface (IOAS-AOLS), 11-15 January 2009, Phoenix, AZ.

T. L. Miller, R. Atlas, P. G. Black, C. Buckley, S. S. Chen, R. E. Hood, J. W. Johnson, L. Jones, C. S. Ruf, E. W. Uhlhorn, and S. Al-Nimri, "Simulation of the impact of new air- and space-based surface wind measurements on H\*Winds analyses," AMS Annual Meeting, January 2009, Phoenix.

Uhlhorn, Eric, R. Atlas, P. Black, C. Buckley, S. Chen, S. El-Nimri, R. Hood, J. Johnson, L. Jones, T. Miller and C. Ruf, "Simulation of the Impact of New Aircraft- and Satellite-Based Ocean Surface Wind Measurements on Estimates of Hurricane Intensity", 63rd Inter-Departmental Hurricane Conference, March 2-5, 2009, St. Petersburg, FL.

Jones, Linwood, Timothy Miller, Robert Atlas, M. C. Bailey, Peter Black, Salem El-Nimri, Robbie Hood, Mark James, James Johnson, Christopher Ruf, and Eric Uhlhorn, "Surface Wind Vector and Rain Rate Observation Capability of the Future Airborne Hurricane Imaging Radiometer (HIRAD)", 63rd Inter-Departmental Hurricane Conference, March 2-5, 2009, St. Petersburg, FL.

Timothy Miller, Robert Atlas, M. C. Bailey, Peter Black, Salem El-Nimri, Robbie Hood, Mark James, James Johnson, Linwood Jones, Christopher Ruf, and Eric Uhlhorn, "Hurricane Observation Capability of Future Hurricane Imaging Radiometer (HIRAD)," Interdepartmental Hurricane Conference, March 2009, St. Petersburg, Florida.

Timothy L. Miller, Eric Uhlhorn, Ceres English, Robert Atlas, John Gamache, Peter Black, Ruba Amarin, Shuyi Chen, Salem El-Nimri, Linwood Jones, Courtney Buckley, Chris Ruf, T. N. Krishnamurti, "Simulation of the impact of new aircraft- and satellite-based ocean surface wind measurements on wind analyses and numerical forecasts," American Meteorological Society Annual Meeting, January 2010, Atlanta.

El-Nimri, Salem, Linwood Jones, Eric Uhlhorn, Chris Ruf and Peter Black, "Hurricane Imaging Radiometer Wind Speed and Rain Rate Retrieval: [Part-1] Development of an Improved Ocean Emissivity Mode", Proc. of MicroRad2010, March 1-4, 2010, Washington DC.

Amarin,Ruba, Linwood Jones, James Johnson, Chris Ruf, Tim Miller and Shuyi Chen, "Hurricane Imaging Radiometer Wind Speed and Rain Rate Retrieval: Part-2. Analysis of Retrieval Accuracy", Proc. of MicroRad2010, March 1-4, 2010, Washington DC.

Timothy Miller, Robert Atlas, M. C. Bailey, Peter Black, Salem El-Nimri, Robbie Hood, Mark James, James Johnson, Linwood Jones, Christopher Ruf, and Eric Uhlhorn, "Hurricane Observation Capability of Future Hurricane Imaging Radiometer (HIRAD)," Interdepartmental Hurricane Conference, March 2010, Savannah.

R. Amarin, J. Johnson, L. Jones, C. Ruf, T. Miller, S. Chen, "Estimates of Hurricane Wind Speed Measurement Accuracy Using the Airborne Hurricane Imaging Radiometer," 29th Conference on Hurricanes and Tropical Meteorology, May 2010, Tucson.

T. L. Miller, M. James, R. Amarin, R. Atlas, M.C. Bailey, P. Black, C. Buckley, S. Chen, S. El-Nimri, R. Hood, J. Johnson, L. Jones, C. Ruf, D. Simmons, E. Uhlhorn, and C. English, "Development, capabilities, and impact on wind analyses of the Hurricane Imaging Radiometer (HIRAD)," 29th Conference on Hurricanes and Tropical Meteorology, May 2010, Tucson.

Ruba Amarin, L. Jones, J. Johnson, C. Ruf, and T. L. Miller, "The Hurricane Imaging Radiometer Wide Swath Simulation and Wind Speed Retrievals," IGARSS 2010, July, Honolulu.

T. L. Miller, R. Amarin, R. Atlas, M. C. Bailey, P. Black, C. Buckley, M. James, J. Johnson, L. Jones, C. Ruf, D. Simmons, and E. Uhlhorn, "Capabilities And Impact On Wind Analyses Of The Hurricane Imaging Radiometer (HIRAD)," IGARSS 2010, July, Honolulu.

Salem F. El-Nimri, W. Linwood Jones, Sonya Ortiz and Sayak Biswas, "An Improved Wideband Ocean Emissivity Radiative Transfer Model", Proc. IEEE IGARSS-10, Jul. 6 - 11, 2010, Honolulu, HA.

T. L. Miller, M. W. James, L. Jones, C. S. Ruf, E. W. Uhlhorn, M. C. Bailey, C. D. Buckley, D. E. Simmons, S. Johnstone, A. Peterson, L. A. Schultz, S. Biswas, J. W. Johnson, G. Shah, D. Fenigstein, W. H. Cleveland, J. Johnson, and R. E. Hood, "Observations During GRIP from HIRAD: Ocean surface wind speed and rain rate," 15th Symposium on Integrated Observing and Assimilation Systems for Atmosphere, Oceans, and Land Surface, January 2011, Seattle.

T. L. Miller et al., "Development and Validation of a Capability for Wide-Swath Storm Observations of Ocean Surface Wind Speed," 65th Interdepartmental Hurricane Conference, Feb-Mar 2011, Miami.

C. Ruf, S. Biswas, M. James, L. Jones, and T. L. Miller, "First tropical cyclone over-flights by the Hurricane Imaging Radiometer," IGARSS 2011, July, Vancouver, Canada.

#### Published Abstracts (Engineering)

B. H. Lim, R. A. Amarin, S. F. El-Nimri, J. Johnson, L. Jones, and C. S. Ruf, "Restrictions on the Field of View for an Undersampled 1-D Synthetic Thinned Aperture Radiometry", Proc. IEEE Intrn. Geosci. Remote Sens. Symp, Barcelona, SP., May, 2007.

Ruba A. Amarin, Salem F. El-Nimri, James W. Johnson, W. Linwood Jones, Boon H. Lim, and Christopher S. Ruf, "Instrument Design Simulations for Synthetic Aperture Microwave Radiometer Imaging of Wind Speed and Rain Rate in Hurricanes", Proc. IEEE IGARSS-07, Jul. 23 - 27, 2007, Barcelona, Spain.

Amarin, R.A., S.F. El-Nimri, J.W. Johnson, W.L. Jones, B.H. Lim and C.S. Ruf, "Instrument design simulations for synthetic aperture microwave radiometric imaging of wind speed and rain rate in hurricanes," Proc. 2007 IEEE International Geoscience and Remote Sensing Symposium, Barcelona, SPAIN, 23-27 July, 2007.

Lim, B.H., R. Amarin, S. El-Nimri, J. Johnson, L. Jones and C.S. Ruf, "Restrictions on the Field of View for an Undersampled 1-D Synthetic Thinned Aperture Radiometry," Proc. 2007 IEEE International Geoscience and Remote Sensing Symposium, Barcelona, SPAIN, 23-27 July, 2007.

Ruf, C., R. Amarin, M.C. Bailey, B. Lim, R. Hood, M. James, J. Johnson, L. Jones, V. Rohwedder and K. Stephens, "The Hurricane Imaging Radiometer – An Octave Bandwidth Synthetic Thinned Array Radiometer," Proc. 2007 IEEE International Geoscience and Remote Sensing Symposium, Barcelona, SPAIN, 23-27 July, 2007.

Ruba Amarin, James Johnson, W. Linwood Jones and Christopher Ruf, "Performance Simulations for a Synthetic Aperture Radiometer Measuring Peak Surface Wind Speed in Hurricanes", Proc. IEEE IGARSS-08, Jul. 6 - 11, 2008, Boston, MA.

Amarin, R., B. Lim, J. Johnson, W.L. Jones and C. Ruf, "Performance Simulations For A Synthetic Aperture Radiometer Measuring Peak Surface Wind Speed in Hurricanes," Proc. 2008 IEEE International Geoscience and Remote Sensing Symposium, Boston, MA, Vol. 1, 363-366, 7-11 July 2008.

C. S. Ruf, L. Jones, M. C. Bailey, T. L. Miller, S. Gross, E. Uhlhorn, R. Hood, M. James, J. Johnson, "Hurricane Imaging Radiometer (HIRAD): Instrument Status and Performance Predictions," IGARSS 2009, July, Capetown, South Africa.

D. Fenigstein, C. Ruf, M. James, D. Simmons, T. Miller, C. Buckley, "Analysis Of Anechoic Chamber Testing Of The Hurricane Imaging Radiometer," IGARSS 2010, July, Honolulu.

#### Other (Presentations, etc.)

Jones, W. L., Johnson, J. W., Ruf, C. S. and M. C. Bailey, "Hurricane Imaging Microwave Radiometer for Operational Satellite Hurricane Measurements", Proceedings 58th Interdept. Hurricane Conf., March 1 – 4, 2004, Charleston, SC

Timothy L. Miller, R. Atlas, P. G. Black, C. Buckley, S. S. Chen, R. E. Hood, J. W. Johnson, L. Jones, C. S. Ruf, E. W. Uhlhorn, T.N. Krishnamurti, C. Inglis, R. Amarin and S. Al-Nimri, "Simulation of the impact of new ocean surface wind measurements on H\*Wind Analyses," Amer. Geophys Union Fall Meeting, Dec. 17, 2008, San Francisco, CA.

T. L. Miller, "Simulation of the impact of new ocean surface wind measurements on H\*Winds Analyses," T. L. Miller and others, AGU Fall Meeting, December 2008.

Jones, Linwood, Timothy Miller, Robert Atlas, M. C. Bailey, Peter Black, Salem El-Nimri, Robbie Hood, Mark James, James Johnson, Christopher Ruf, and Eric Uhlhorn, "Surface Wind Vector and Rain Rate Observation Capability of the Future Airborne Hurricane Imaging Radiometer (HIRAD)," 2009 NASA Ocean Vector Wind Sci Team Meeting, May 18-20, 2009, Boulder, CO.

Timothy Miller, F. R. Robertson, C. Cohen, and J. Mackaro, "Demonstration of Effects on Tropical Cyclone Forecasts with a High Resolution Global Model from Variation in Cumulus Convection Parameterization," AGU Fall Meeting, December 2009, San Francisco.

Ruba A. Amarin, W. Linwood Jones, Salem F. El-Nimri and James W. Johnson, "A Wide-Swath Hurricane Imaging Radiometer for Imaging of Wind Speed and rain Rate in Hurricanes", URSI Nat. Radio Sci Meeting, Jan 20-23, 2010, Boulder, CO.

