National Aeronautics and
Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

Validation Opening Remarks and AIRS-AMSR-E Comparisons

AIRS Science Team Meeting
May 3-6, 2005

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Opening Remarks

- **Congratulation to the authors who have submitted their papers to the JGR Special Section on AIRS Validation!**
- TITLE: Radiometric Calibration Validation of AIRS for Climate Applications
- AUTHORS: H. H. Aumann and D.T. Gregorich
- TITLE: Validation of Aqua AIRS/AMSU/HSB Precipitation Estimates
- AUTHORS: Frederick W. Chen and David H. Staelin
- TITLE: Three-Way Comparisons of AIRS, ATOVS and Radiosonde Temperature and Moisture Profiles
- AUTHORS: M. Goldberg, C. Barnet, and M. Divakarla
- TITLE: Accuracy and Performance Assessment for Six Operational Radiosonde Types Launched During AWEX, and Implications for AIRS Validation
- AUTHORS: Larry M. Miloshevich, Holger Voemel, David N. Whiteman, Barry M. Lesht, and Francis J. Schmidlin
- TITLE: Infrared and microwave sensor validation during AEROSE 2004
- AUTHORS: Nicholas R. Nalli and Pablo Clemente-Colon, Peter Minnett, M. Szczodrak, Andy Jessup, Ruth Branch, Vernon Morris, Mitch Goldberg, Chris Barnet, Walter Wolf, Everette Joseph, Wayne Feltz, and Robert Knuteson
- TITLE: Microwave Radiative Transfer Model Validation
- AUTHORS: P. Rosenkranz, C. Barnet
- TITLE: AIRS/AMSU/HSB Cloud Liquid Water Profile Retrieval Algorithm and Validation
- AUTHORS: P. Rosenkranz
- TITLE: Validation of the AIRS RTA: (1) Water vapor
- AUTHORS: L. Strow, S. Hannon, S. De Souza-Machado, D. Tobin
- TITLE: Comparison of Infrared Radiance Observations from AIRS, MODIS, and CERES on EOS Aqua
- AUTHORS: David C. Tobin, Henry E. Revercomb, Chris Moeller, Thomas S. Pagano
- TITLE: ARM Site Atmospheric State Best Estimates for AIRS Forward Model and Retrieval Validation
- AUTHORS: David C. Tobin, Henry E. Revercomb, Robert O. Knuteson, Wayne F. Feltz, Barry Lesht, Ted Cress, L. Larrabee Strow, Scott E. Hannon, Eric J. Fetzer
- TITLE: Radiometric and Spectral Validation of AIRS Observations with the Aircraft based Scanning High resolution Interferometer Sounder
- AUTHORS: David C. Tobin, Henry E. Revercomb, Robert O. Knuteson, Fred A. Best, William L. Smith, Paul van Delst, Daniel D. LaPorte, Scott D. Ellington, Mark W. Werner, Ralph G. Dedecker, Ray K. Garcia, Nick N. Ciganovich, H.Benjamin Howell, Steven Dutcher, Joe K. Taylor, Thomas S. Pagano, Michael D. King, Stephen A. Mango

Coming Soon

- **We urge the others to keep up the good work and submit soon:**
- TITLE: Comparison of Total Water Estimates from AIRS and AMSR-E
- AUTHORS: E. J. Fetzer, S.-Y. Lee, E. T. Olsen, and H. H. Aumann
- TITLE: Introduction to AIRS Validation
- AUTHORS: Eric J. Fetzer and W. Wallace McMillan
- TITLE: Error Characterization and Properties of Cloud-Cleared Radiances Estimated from AIRS Radiances
- AUTHORS: E. Fishbein, H. Aumann, M. Chahine, L.Chen
- TITLE: Spectral Calibration of AIRS for Climate Applications
- AUTHORS: S. Gaiser, L. Strow
- TITLE: ABOVE: Overview of the AIRS BBAERI Ocean Validation Experiment and AIRS Profile Retrieval Validation
- AUTHORS: W. W. McMillan, R. Hoff, K. Lightner, M. L. McCourt, E. Maddy, N. Kolb, K. McCann, J. Comer, F. Russo, E. Hintsa, M. Newchurch, C. K. Rutledge, L. L. Strow
- TITLE: Validation of AIRS water vapor retrievals based on radiosondes and GPS receivers
- AUTHORS: Larry McMillin, James G.Yoe, Seth I. Gutman, Jiang Zhao, M. K. Rama Varma Raja
- TITLE: AIRS Ozone Validation
- AUTHORS: Mike Newchurch and Bill Irion
- TITLE: Airborne NAST and Dropsonde Validation of AIRS Vertical Sounding Capabilities
- AUTHORS: W. L. Smith, TBD, D. K. Zhou, A.M. Larar, and Xu Liu, P. Antonnelli, D. Tobin, R. O. Knuteson, and H. E. Revercomb, and S. Mango
- TITLE: Validation of Inter-annual Monthly Mean Difference of AIRS products
- AUTHORS: Joel Susskind, John Blaisdell, Emmanuel Dadson, Lena Iredell, Fricky Keita, Louis Kourvaris, and Gyula Molnar
- TITLE: Measurements of temperature and humidity profiles over the ocean: comparisons of AIRS retrievals with ship-based remote sensing, in situ measurements and ECMWF analysis.
- AUTHORS: Malgorzata Szczodrak, Peter J. Minnett, Nicholas R. Nalli, Wayne F. Feltz
- TITLE: The use of the Antarctic Plateau as a validation site for the Atmospheric Infrared Sounder (AIRS)
- AUTHORS: V.P. Walden, W.R. Roth, R.S. Stone, and B. Halter
- TITLE: The AIRS Water Vapor Experiment and its Relationship to AIRS Validation
- AUTHORS: D. N. Whiteman, B. Demoz, F. Schmidlin, L. Miloshevich, B. Lesht, H. Vömel, Z. Wang, J. Veselovskii, F. Russo, S. Hannon

- AIR-AMSR-E Total Water Vapor Comparisons

Overview

- **Main goal: *biases* by**
  - Geographic region
  - AIRS cloud fraction
  - Cloud Fraction
- **Also**
  - Understand effects of HSB loss
  - Higher order stats for certain cases
  - Understand implications for cloud clearing and water vapor profiles.
    - MLS comparison for upper trop water vapor.
- **Quality flags**
  - MW = qual_cloud_olr = 0, qual_temp_bot > 0
  - IR = qual_cloud_olr = 0, qual_temp_bot = 0

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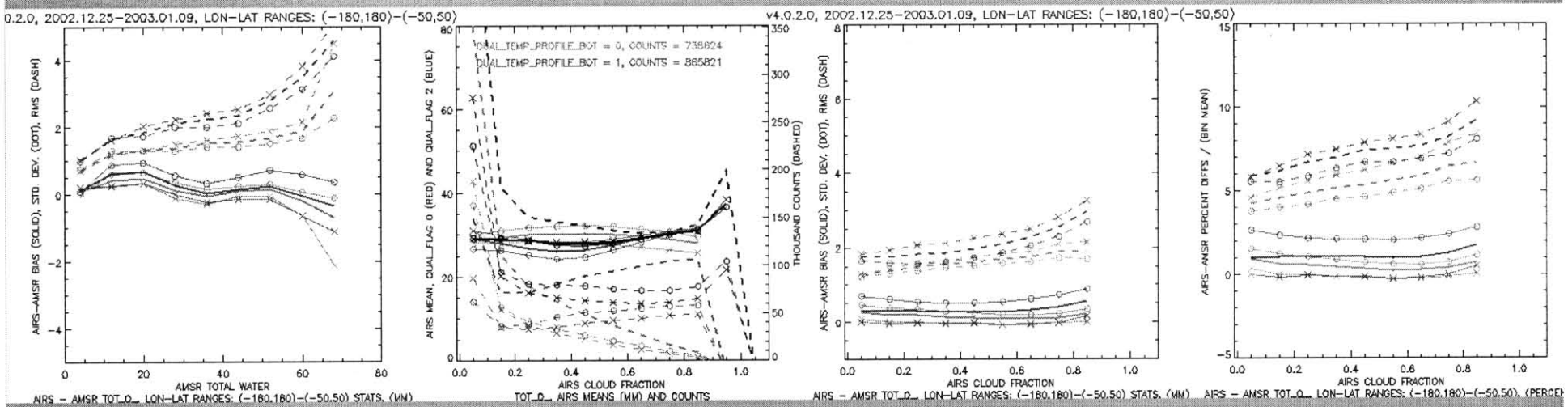
AIRS Atmospheric Infrared Sounder

Differences by Total Water and Cloud Amount



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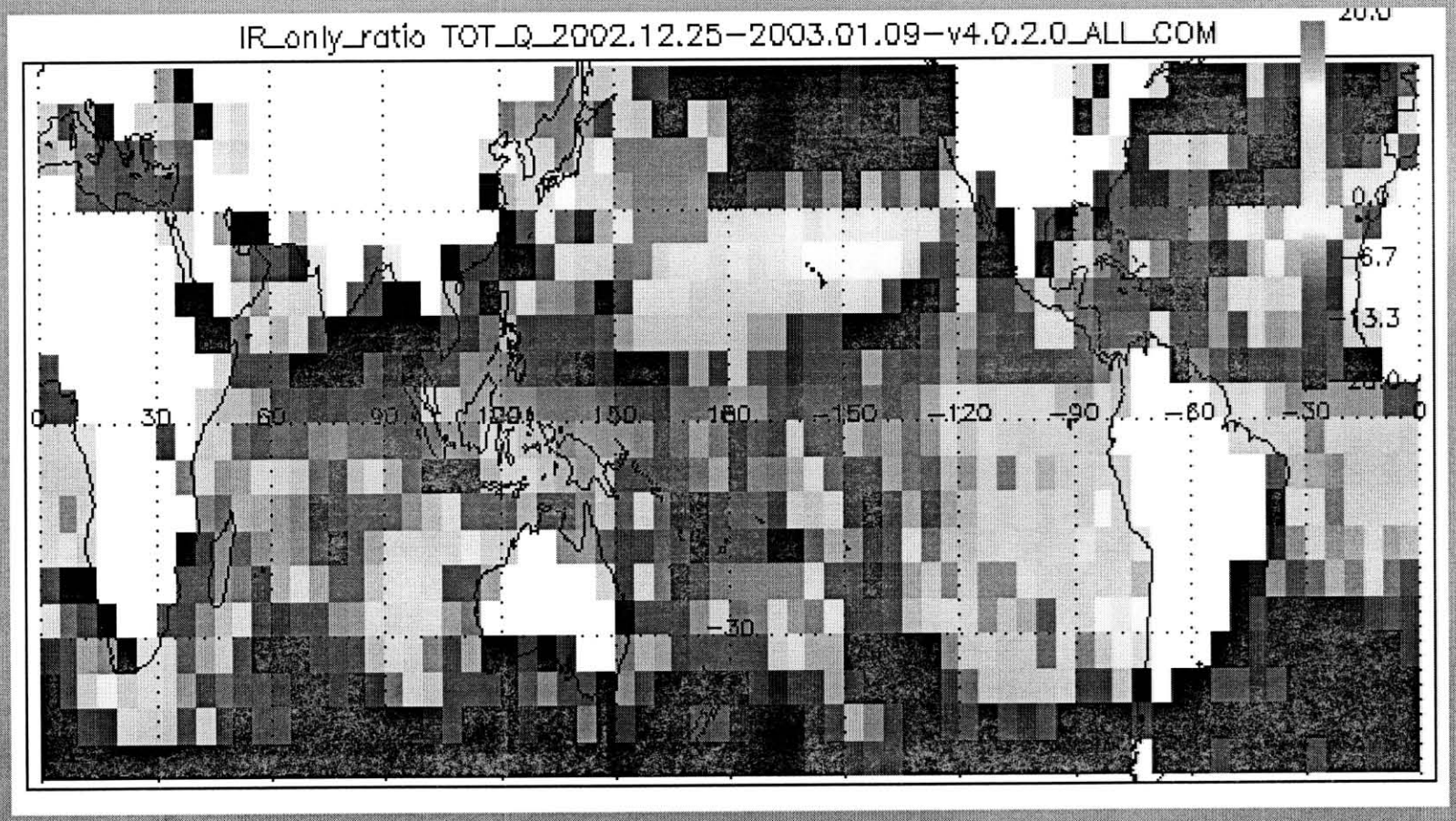
100.*[Mean(AIRS) - Mean(AMSR-E)] / Mean(AMSR-E)



Conclusions

- Globally, mean differences are ~5% RMS
- Locally, mean differences can be >15%.
- Loss of HSB gives amount-dependent biases.