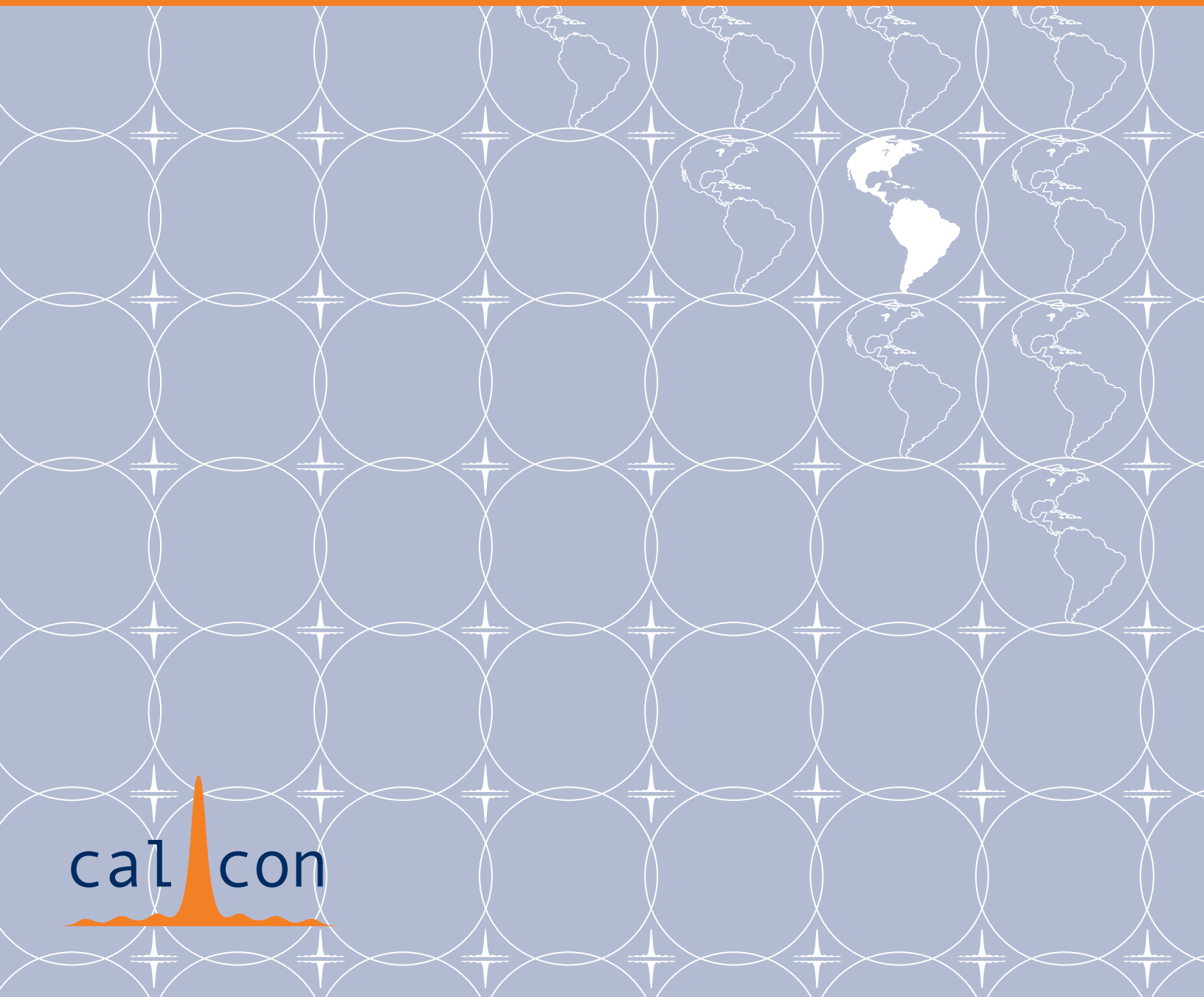
2012
CALCON Technical Conference

Sessions Posters

August 27 to August 30, 2012

Utah State University Eccles Conference Center, Logan, Utah, USA



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Welcome to the 21ST Conference on Characterization and Radiometric Calibration for Remote Sensing. We hope you find the oral and poster presentations informative and interesting. We encourage you to take advantage of this time to discuss ideas and challenges, make new contacts, and foster existing relationships. Thank you for joining us.

Conference Presenters

The Speaker Ready Room is located in Room 212. Speakers must deliver their presentation to be uploaded to the server on or before the day and time specified below:

Monday Speakers:	Due by Monday, August 27	12:30 P.M.
Tuesday Speakers:	Due by Monday, August 27	3:00 P.M.
Wednesday Speakers:	Due by Tuesday, August 28	3:00 P.M.
Thursday Speakers:	Due by Wednesday, August 29	3:00 P.M.

Conference Presenters

All speakers are required to attend an audiovisual meeting with the technician and session chairs. This is your opportunity to be trained with the audio visual equipment as well as meet your session chair. You are required to attend the meeting on the day of your presentation. Audiovisual meetings will be held in Auditorium Room 216 at the following times:

Monday Speakers & Session Chairs:	Monday, August 27	12:30-1:00 P.M.
Tuesday Speakers & Session Chairs	Tuesday, August 28	7:30-7:55 A.M.
Wednesday Speakers & Session Chairs:	Wednesday, August 29	7:30-7:55 A.M.
*Thursday Speakers & Session Chairs:	Thursday, August 30	7:30-7:55 A.M.

*Thursday's required audiovisual meeting is held at the Space Dynamics Laboratory

Exhibit Hours

Monday, August 27:	12:00 P.M.–5:00 P.M.	Check-In/Set-up
Tuesday, August 28:	7:00 A.M.–9:30 A.M.	Final Touch-Ups
	9:30 A.M.–4:30 P.M.	Show Open
Wednesday, August 29:	9:30 A.M.–4:30 P.M.	Show Open
	4:30 P.M.–5:00 P.M.	Take-Down

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Visit the conference website
www.calcon.sdl.usu.edu

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Conference Schedule*

Location: The Pre-Conference Tutorials and Monday through Wednesday conference sessions will be held in the Eccles Conference Center on the Utah State University campus. Thursday conference sessions and events will take place at the Space Dynamics Laboratory Calibration Building.

Monday, August 27, 2012

7:30 A.M.–8:30 A.M.	Registration
8:30 A.M.–12:00 P.M.	**Pre-Conference Tutorials** **Option 1:** MODIS On-orbit Calibration and Lessons Learned **Option 2:** Intro to Infrared Detectors and Focal Plane Arrays
12:00 P.M.–1:00 P.M.	Lunch Break
12:00 P.M.–1:00 P.M.	Registration
12:30 P.M.	AV Meeting for Session Chairs and Presenters
1:15 P.M.	Conference Welcome
1:30 P.M.–2:55 P.M.	**Technical Session:** Calibration Methods for Climate Change Measurement & Modeling
2:55 P.M.–3:25 P.M.	Break
3:25 P.M.–5:50 P.M.	**Technical Session:** Radiometric Sensor Data, Uncertainty and Error Analysis
6:30 P.M.–8:30 P.M.	Opening Social at the Space Dynamics Laboratory

Tuesday, August 28, 2012

7:30 A.M.–8:15 A.M.	Breakfast
7:30 A.M.	AV Meeting for Session Chairs and Presenters
8:15 A.M.	Conference Announcements
8:25 A.M.–9:50 A.M.	**Technical Session:** Inter-calibration and Validation of Operational Sensors
9:50 A.M.–10:35 A.M.	Poster and Exhibit Viewing Break
10:35 A.M.–11:55 A.M.	**Technical Session:** Inter-calibration and Validation of Operational Sensors (cont.)
11:55 A.M.–1:00 P.M.	Lunch Provided
12:00 P.M.–1:00 P.M.	LBIR Users' Board Meeting—Eccles Conference Center Room 313 Boardroom
1:00 P.M.–2:00 P.M.	**Keynote Introduction and Address:** Mr. Douglas Loverro
2:20 P.M.–3:45 P.M.	**Technical Session:** Pre-launch Testing and Post-launch Performance
3:45 P.M.–4:05 P.M.	Break
4:05 P.M.–6:35 P.M.	**Technical Session:** Equipment, Capabilities, and Facilities for Radiometric Calibration
_____	Free Evening

Wednesday, August 29, 2012

7:30 A.M.–8:00 A.M.	Breakfast
7:30 A.M.	AV Meeting for Session Chairs and Presenters
8:00 A.M.	Conference Announcements
8:05 A.M.–10:10 A.M.	**Technical Session:** Calibration Methods using Celestial Objects
10:10 A.M.–10:40 A.M.	Poster Viewing Break
10:40 A.M.–12:05 P.M.	**Technical Session:** Sensor Calibration for Ground-Based & Airborne Radiometric Measurements
12:05 P.M.–1:05 P.M.	Lunch provided
1:05 P.M.–1:50 P.M.	**Technical Session:** Calibration of Microwave Radiometers & Other Microwave Instruments
1:50 P.M.–1:55 P.M.	Break
1:55 P.M.–3:40 P.M.	**SPOTLIGHT Session:** JPSS—Part I
3:40 P.M.–3:50 P.M.	Break
3:50 P.M.–5:30 P.M.	**SPOTLIGHT Session:** JPSS (cont.)
6:30 P.M.–8:30 P.M.	BBQ in Logan Canyon

Thursday, August 30, 2012

Held at the Space Dynamics Laboratory Calibration Building

7:30 A.M.–8:00 A.M.	Breakfast
7:30 A.M.	AV Meeting for Session Chairs and Presenters
8:00 A.M.	Conference Announcements
8:05 A.M.–10:10 A.M.	**SPOTLIGHT Session:** JPSS—Part II
10:10 A.M.–10:40 A.M.	Break
10:40 A.M.–11:00 A.M.	Check-In: Restricted Session
11:00 A.M.–12:05 P.M.	**Restricted Session Section 1:** Distribution D
12:05 P.M.–1:00 P.M.	Lunch Provided
1:00 P.M.–1:15 P.M.	Check-In: Restricted Session (cont.)
1:15 P.M.–2:35 P.M.	**Restricted Session Section 1:** Distribution D (cont.)
2:35 P.M.–3:05 P.M.	Break
3:05 P.M.–3:20 P.M.	Check-In Restricted Session
3:20 P.M.–4:45 P.M.	**Restricted Session Section 2:** Secret/No Foreign
4:45 P.M.–4:55 P.M.	Break
4:55 P.M.–6:15 P.M.	**Restricted Session Section 2:** Secret/No Foreign (cont.)
6:15 P.M.	Conference End

*Conference schedule is based on information available at the time of publication and is subject to change

Exhibit Information

Exhibit Hours

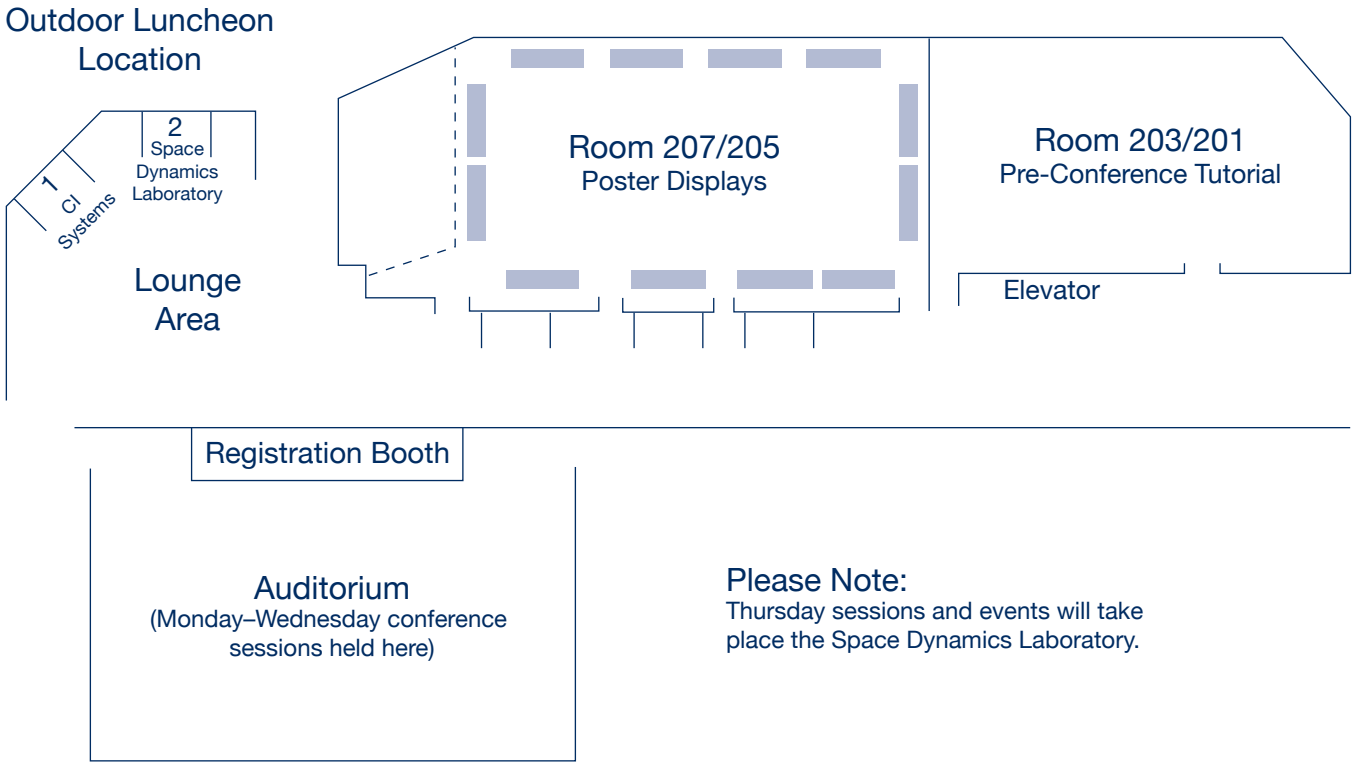
Monday, August 27
Setup

Tuesday, August 28
9:30 A.M. to 4:30 P.M.

Wednesday, August 29
9:30 A.M. to 4:30 P.M.

Thursday, August 30
Exhibit Closed

Exhibit Layout



Thank you to our Luncheon, Refreshment & Social sponsors!

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Space Dynamics Laboratory
Utah State University Research Foundation

Please note that by attending the Conference on Characterization and Radiometric Calibration for Remote Sensing (CALCON Technical Conference) you may be the subject of still photography or videography which is used by the Utah State University Research Foundation, its public relations agency or contracted agents for purposes of promoting CALCON. By attending, you agree to grant CALCON, the Utah State University Research Foundation, its agents and exhibitors the right to use your likeness in any photographic or video coverage of the event including exhibitors' or sponsors' activities.

Exhibitor Descriptions

CI Systems
Booth Space:1

759 Cochran Street #A
Simi Valley, CA 93065
Exhibit Manager: Kim Browne
805-520-2234
kbrowne@cisystemsinc.com
www.ci-systems.com/HTMLs/Home.aspx

CI Systems' turnkey test stations leverage our expertise in infrared and visible sources, collimators, range simulators, laser measurement, motion control, software, and unit-under-test fixturing to deliver reliable, highly accurate systems that are backed by knowledgeable and responsive service professionals.

Space Dynamics Laboratory
Booth Space: 2
1695 N Research Park Way
North Logan, UT 84341
Exhibit Manager: Yvonne Polak
435-713-3069
yvonne.polak@sdl.usu.edu
spacedynamics.org

The Space Dynamics Laboratory (SDL), a nonprofit research corporation owned by Utah State University, has over five decades of experience in developing innovative solutions for complex science and military sensing needs. SDL's expertise includes ground-, air- and space-based IR, visible, and UV sensors; hyperspectral, polarimetric, and hypertemporal systems; small satellites and supporting technologies; rapid development of prototype hardware and software; concept validation studies; real-time intelligence, surveillance and reconnaissance data compression and exploitation systems; contamination control and stray light analysis; and cryogenic and thermal management systems. SDL is an international leader in sensor system characterization and calibration, and hosts the Annual Conference on Characterization and Radiometric Calibration for Remote Sensing. Headquartered in a 220,000 ft^2 research complex in Logan, Utah, SDL also operates facilities in Albuquerque, NM; Bedford, M; Los Angeles, CA; Houston, TX; Huntsville, AL; Colorado Springs, CO; and Washington, DC, and employs over 400 personnel.

Wednesday Evening BBQ

Join us August 29TH for a Cache Valley BBQ in beautiful Logan Canyon with live music from the Dry Lake Band.

Made up of five local musicians who play guitar, banjo, stand-up bass, mandolin, and fiddle, the Dry Lake Band specializes in original and traditional bluegrass and is known for their musicianship and harmonies. Don't miss out on this great evening!

Monday, August 27

— 7:30 A.M. to 8:30 A.M. Registration

— 8:30 A.M. to 12:00 P.M. Pre-Conference Tutorials

Pre-Conference Tutorial Option 1—MODIS On-orbit Calibration and Lessons Learned

Jack Xiong—Sciences and Exploration Directorate, NASA Goddard Space Flight Center

The Moderate Resolution Imaging Spectroradiometer (MODIS) is a key instrument for NASA's Earth Observing System (EOS) Terra and Aqua missions. Since launch, Terra and Aqua MODIS have successfully operated for more than 12 and 10 years, respectively, and generated an unprecedented amount of data products for the science and user community over a wide range of applications. MODIS was developed with improved design and stringent calibration requirements over its heritage sensors in order to extend and enhance their long-term data records. Its follow-on instrument, the Visible/Infrared Imager Radiometer Suite (VIIRS), was launched on-board the Suomi National Polar-orbiting Partnership (NPP) spacecraft October 28, 2011. MODIS collects data in 36 spectral bands, covering wavelengths from 0.41 to 14.5mm, and at 250m, 500m, and 1km spatial resolutions (nadir). MODIS on-orbit calibration is provided by a set of onboard calibrators (OBC), including a solar diffuser (SD), a solar diffuser stability monitor (SDSM), a blackbody (BB), and a spectroradiometric calibration assembly (SRCA). In addition to the onboard calibrators, regular lunar observations are made by both Terra and Aqua MODIS to track their calibration stability in the reflective solar region. This tutorial session provides an overview of MODIS on-orbit calibration and characterization methodologies. It discusses challenging issues and lessons learned from sensor design, operation, calibration, and inter-comparisons. Examples of instrument on-orbit performance are illustrated with a focus on the improvements made based on various lessons learned. It is expected that MODIS experience and lessons will continue to provide valuable information for future earth observing missions/sensors.

Presentation not available

Tutorial Option 2—Intro to Infrared Detectors and Focal Plane Arrays

John Hubbs—Space Vehicles Directorate, Air Force Research Laboratory

This course will provide a broad and useful background on optical detectors, both photon and thermal, with a special emphasis placed on the infrared detectors. The fundamentals of responsivity (RI), noise equivalent power (NEPI) and specific detectivity (D*) will be discussed. These figures of merit will be extended to photon noise limited performance and Johnson noise limitations (RA product). In addition, the course presents a fundamental understanding of two-dimensional arrays applied to detecting the infrared spectrum. The physics and electronics associated with 2-D infrared detection are stressed with special emphasis on the hybrid architecture unique to two-dimensional infrared arrays.

— 12:00 P.M. to 1:15 P.M. Registration

— 1:15 P.M. to 1:30 P.M. Conference Welcome: Mark McLellan, Vice President for Research & Dean of Graduate Studies, Utah State University

Calibration Methods for Climate Change Measurement and Modeling

Methods and techniques that are capable of meeting the very stringent calibration precision and accuracy requirements of climate change measurement and modeling programs, and calibration results for sensors designed to achieve climate-quality measurement results.

Session Chair: Fred Best, University of Wisconsin

— 1:35 P.M. **On-Orbit Absolute Radiance Standard for the Next Generation of IR Remote Sensing Instruments**
Fred Best, Douglas Adler, Claire Pettersen, Henry Revercomb, P. Jonathan Gero, Joseph Taylor, Robert Knuteson, John Perepezko—University of Wisconsin-Madison

— 1:55 P.M. **The University of Wisconsin Space Science and Engineering Center Absolute Radiance Interferometer (ARI): Instrument Overview and Radiometric Performance**
Joe Taylor, Henry Revercomb, Jonathon Gero, Fred Best, David Tobin, Robert Knuteson—University of Wisconsin-Madison; Henry Buijs, Frederic Grandmont—ABB-Bomem Inc.

— 2:15 P.M. **Low Cost, Low Risk Use of Improved Calibration Techniques to Detect Cloud Climate Feedback within One Decade of the Present (2012-2022)**
Grant Matthews—ITT Exelis

— 2:35 P.M. **Inter-Calibration of AIRS with IASI and CrIS**
Larrabee Strow, Sergio de Sousa Machado—University of Maryland, Baltimore County

Monday, August 27

— 2:55 P.M. to 3:25 P.M. Refreshment Break

Radiometric Sensor Data, Uncertainty and Error Analysis

Techniques, logistics, and algorithms required to reduce data, derive results, and estimate uncertainties. Explores the process required to produce science quality results.

Session Chair: David Pollock, University of Alabama-Huntsville

— 3:30 P.M. **A Numerical Simulator for Studying Calibration Using Noise**
Paul Racette, Thomas Clune, Englin Wong—NASA Goddard Space Flight Center; David Walker, Kevin Coakley, Jolene Splett—NIST; Derick Rivers, Edward Boone, Robert Leonard—Virginia Commonwealth University

— 3:50 P.M. **Diffraction Effects on Broadband Radiation in Multi-staged Systems**
Eric Shirley—NIST

— 4:10 P.M. **Uncertainty Requirements in the Contract SOW for GOES-R and Implementation of VIM3 and GUM**
Raghu Kacker—NIST; Aaron Pearlman—Integrity Applications Incorporated; Raju Datla—Riverside Technology, Inc.

Presentation not available **Uncertainty Evaluation of Broadband Optical Instruments Radiometric Calibration**
Valeriy Gavrilov, Boris Khlevnoy, Aleksandr Panfilov—All-Russian Research Institute for Optical and Physical Measurements (VNIIOFI)

— 4:50 P.M. **Combining Imaging Statistics and Side Slither Imagery to Estimate Relative Detector Gains**
Cody Anderson, Andreas Brunn, Michael Thiele—RapidEye AG

— 5:10 P.M. **Comparing Hyperion Lunar Observed with Model Predicted Irradiances in Support of GOES-R Advanced Baseline Imager (ABI) Calibration**
Xi Shao—Riverside Technology Incorporated; Changyong Cao—NOAA/NESDIS/STAR; Sirish Uprety—CIRA/Colorado State University

— 5:30 P.M. **A Simplified Three Dimensional Model of the VIIRS On-board Calibration System for Visualization and Anomaly Investigation**
David Pogorzala—Integrity Applications Incorporated; Changyong Cao—NOAA/NESDIS/STAR

— 6:30 P.M. to 8:30 P.M. Opening Social at the Space Dynamics Laboratory

Monday Evening Opening Social

1695 North Research Park Way, North Logan

Join us at the Pond! Hosted by the Space Dynamics Laboratory, this gathering kicks off the week with delicious food, cool drinks and live music in a beautiful setting. SDL will open its doors and provide tours highlighting calibration capabilities and facilities.

Space Dynamics LABORATORY
Utah State University Research Foundation

Tuesday, August 28

— 7:30 A.M. to 8:15 A.M. Continental Breakfast

— 8:15 A.M. Conference Announcements

Inter-calibration and Validation of Operational Sensors

Performance comparison between sensors of differing scientific objectives, capabilities, and mission parameters to assess measurement bias and uncertainty.
Session Co-chairs: Leonard Hanssen and Eric Shirley, NIST

— 8:30 A.M. **Inter-calibration of COMS Infrared and Visible Channels**
Dohyeong Kim, Won-Seok Lee, Ho-seung Lee, Sungduck Yoon, Hee-Sang Lee—Korea Meteorological Administration

— 8:50 A.M. **The Contribution of ROSAS Automated Photometric Station to Vicarious Calibration of PLEIADES PHR1A Satellite**
Philippe Gamet, Aimé Meygret, Bertrand Fougnie, Sophie Lacherade —CNES

— 9:10 A.M. **Using Hyperion to Develop an Absolute Calibration Model for the Libya 4 Invariant Test Site**
Dennis Helder, Nischal Mishra, Sandip Shrestha, Larry Leigh, David Aaron—South Dakota State University

— 9:30 A.M. **Onboard Blackbody Calibration Algorithm of Chinese FY-2 Geostationary Imager Based on GSICS Reference Radiance**
Xiuqing Hu—Earth Research Technology Co.; Likun Wang—University of Maryland; Fuzhong Weng—NOAA/NESDIS/STAR; Na Xu—China Meteorological Administration

— 9:50 A.M. to 10:35 A.M. Refreshment Break
Poster Viewing—Authors Present

Inter-calibration and Validation of Operational Sensors (cont.)

— 10:35 A.M. **Using Hyper-Spectral SCIAMACHY Radiances to Uniformly Calibrate Contemporary Geostationary Visible Sensors**
David Doelling—NASA Langley Research Center; Benjamin Scarino, Daniel Morstad, Rajendra Bhatt, Arun Gopalan—SSAI

— 10:55 A.M. **Characterization of Deep Convective Clouds as Absolute Calibration Targets for Visible Sensors**
Daniel Morstad, Rajendra Bhatt, Benjamin Scarino, Arun Gopalan—SSAI; David Doelling—NASA Langley Research Center

— 11:15 A.M. **First Results from Real-time NSOF Ground System Correction of GOES 13 Imager Stray Light during Eclipse Periods**
Grant Matthews, Steven Buford, Allison Bright—ITT EXELIS; Xiangqian Wu, Hyre Bysal—NOAA/NESDIS; Tim Schmitt—University of Wisconsin

— 11:35 A.M. **Cross-calibration of Geostationary Meteorological Satellite Visible Channel Imagers Using the Moon as a Common Reference**
Tom Stone—U.S. Geological Survey

Tuesday, August 28

— 11:55 A.M. to 1:00 P.M. Lunch Provided

— 1:00 P.M. to 2:00 P.M. Keynote Introduction and Address: Mr. Douglas L. Loverro

Keynote Speaker

Mr. Douglas L. Loverro

Executive Director, Space and Missile Systems Center, Air Force Space Command

Mr. Douglas L. Loverro, a member of the Defense Intelligence Senior Executive Service, is the Executive Director, Space and Missile Systems Center, Air Force Space Command, Los Angeles Air Force Base, Calif. He is the senior civilian executive and principal assistant to the commander. His responsibilities include Air Force research, design, development and acquisition of space launch, command and control, and satellite systems.

Mr. Loverro began his Air Force career in 1976 after graduating from the U.S. Air Force Academy with a Bachelor of Science degree in chemistry. During his career he served in the full range of assignments within the Air Force's and the Department of Defense's developmental sectors including multiple Air Force laboratories, the Electronic Systems and Space and Missile Systems development centers, the Office of the Secretary of Defense, and the National Reconnaissance Office.

Mr. Loverro is credited with a wide-ranging list of accomplishments including the invention of the supersonic chemical oxygen-iodine laser, now the heart of the Air Force's Airborne Laser; the initiation of the Air Force's Global Broadcast Service; and establishing the foundation for all Global Positioning System modernization. In November 2002, Mr. Loverro was selected by the Under Secretary of the Air Force to lead the Future Imagery Architecture Program, the nation's largest-ever space system development. He retired from active duty in February 2006 upon selection as a member of the Defense Intelligence Senior Executive Service. He assumed his current role in January 2008.

Education

- 1976 Bachelor of Science degree in chemistry, U.S. Air Force Academy, Colorado Springs, Colo.
- 1980 Distinguished graduate, Squadron Officer School, Maxwell AFB, Ala.
- 1980 Master of Business Administration degree, University of West Florida, Pensacola
- 1987 Master of Science degree in physics, University of New Mexico, Albuquerque
- 1989 Distinguished graduate, Air Command and Staff College, Maxwell AFB, Ala.
- 1989 Master of Science degree in political science, Auburn University, Ala.
- 1994 Distinguished graduate and Senior Research Fellow, Industrial College of the Armed Forces, Fort Lesley J. McNair, Washington, D.C.
- 1997 Defense Systems Management College, Fort Belvoir, Va.

Awards and Honors

- Defense Superior Service Medal with two oak leaf clusters
- Legion of Merit
- Meritorious Service Medal with two oak leaf clusters
- Air Force Commendation Medal
- Air Force Achievement Medal
- Air Force Organizational Excellence Award
- National Reconnaissance Office Gold Medal for Distinguished Service

Career Chronology

- 1976–1980, experimental chemist, High Explosives Research and Development Facility, Air Force Armament Laboratory, Eglin AFB, Fla.
- 1980–1985, Technical Director, Chemical Oxygen-Iodine Laser, Air Force Weapons Laboratory, Kirtland AFB, N.M.
- 1985–1988, Commandant of Cadets and senior instructor, ROTC Detachment, Massachusetts Institute of Technology, Cambridge
- 1989–1993, Program Manager, Advanced C3I Systems Program Office, Hanscom AFB, Mass.
- 1994–1997, staff assistant for Military Satellite Communications, Office of the Secretary of Defense, the Pentagon, Washington, D.C.
- 1997–1999, Director of Advanced Systems, Headquarters Space and Missile Systems Center, Los Angeles AFB, Calif.
- 1999–2002, System Program Director, Navigation Satellite Timing and Ranging Global Positioning System Joint Program Office, Headquarters Space and Missile Systems Center, Los Angeles AFB, Calif.
- 2002–2005, Commander, Future Imagery Architecture Materiel Wing, National Reconnaissance Office, Chantilly, Va.
- 2005–2007, Associate Director, Imagery Systems Acquisition and Operations, National Reconnaissance Office, Chantilly, Va.
- 2008–present, Executive Director, Space and Missile Systems Center, Air Force Space Command, Los Angeles AFB, Calif.

Tuesday, August 28

Pre-launch Testing and Post-launch Performance

Assessment of pre- and post-launch calibration and performance characterization for operational remote sensing systems.

Session Chair: Raju Datla, NOAA

— 2:25 P.M. **VIIRS On-orbit Optical Anomaly**
Eugene Waluschka—NASA

— 2:45 P.M. **CrIS On-orbit Spectral and Radiometric Performance**
Denise Hagan, Degui Gu, Chunming Wang, Lihong Wang—Northrop Grumman Aerospace Systems

— 3:05 P.M. **Onboard Calibration Trends of ASTER/TIR**
Fumihiro Sakuma, Masakuni Kikuchi—Japan Space Systems; Hidehiko Ono—Fujitsu Limited

— 3:25 P.M. **The Specular Array Radiometric Calibration (SPARC) Technique As A Vicarious Methodology For Accurate Inter-Sensor Calibration**
Stephen Schiller, John Silny—Raytheon Space and Airborne Systems; Martin Taylor—GeoEye Inc.

— 3:45 P.M. to 4:05 P.M. Break

Equipment, Capabilities, and Facilities for Radiometric Calibration

Hardware and resources to support national and international requirements for radiometric calibration of remote sensing instruments, including long-term trending and performance enhancements of existing facilities.

Session Chair: Adriaan Carter, Booz Allen Hamilton

— 4:10 P.M. **Legacy of NOAA, NASA and NIST Cooperation in Developing Radiometric Calibration Standards, Equipment and Methodologies**
Raju Datla, Michael Weinreb, Changyong Cao—NOAA

— 4:30 P.M. **The Heated Halo for Space-Based Blackbody Emissivity Measurement**
Jonathan Gero, Joe Taylor, Fred Best, Hank Revercomb, Ray Garcia, Robert Knuteson, David Tobin, Doug Adler, Nick Ciganovich, Steve Dutcher—University of Wisconsin, Space Science and Engineering Center

— 4:50 P.M. **Real Time Hardware-in-the-loop for Infrared Systems**
Charles Dionne—BAE Systems

— 5:10 P.M. **Measurements of Infrared Sources with the Missile Defense Transfer Radiometer**
Simon Kaplan, Solomon Woods—NIST; Adriaan Carter—Booz Allen Hamilton, Inc.; Timothy Jung—Jung Research and Development Corp.

— 5:35 P.M. **An Anthology on the Development and Applications of Space Grade Spectralon**
Mark Helmlinger, Angelo Arecchi, Chris Durell, Greg McKee, Dan Scharpf—Labsphere Inc; Carol Bruegge—NASA Jet Propulsion Laboratory

Presentation not available **Performance and Calibration of Multicolor Infrared FPAs**
Rudolf Goldflam, Mike Tostanoski, Terry Deaton—Aeroflex RAD; Kathryn Doughty—Fifth Gait Technologies, Inc.

— 6:15 P.M. **A Balloon-Borne Light Source for Precision Photometric Calibration**
Maxwell Fagin, Yorke Brown—Dartmouth College; Justin Albert—University of Victoria; Christopher Stubbs—Harvard College

Free Evening

Visit the conference website
www.calcon.sdl.usu.edu

Wednesday, August 29

— 7:30 A.M. to 8:00 A.M. Continental Breakfast

— 8:00 A.M. Conference Announcements

Calibration Methods Using Celestial Objects

Presentation of radiometric measurements and calibration methods using the Sun, Moon, stars, and other celestial objects in the ultra-violet, visible, and infrared wavelengths.

Session Chair: Tom Stone, U.S. Geological Survey

— 8:10 A.M. **Update and Status of the Aerospace Stellar Spectral Energy Distribution Catalog**
Ray Russell, Richard Rudy, George Rossano, Daryl Kim, Kirk Crawford—The Aerospace Corporation; Mark Skinner, Steve Gregory—Boeing LTS; Michael Sitko—The University of Cincinnati

— 8:30 A.M. **ACCESS: Design Performance and Calibration Status**
Mary Elizabeth Kaiser—Johns Hopkins University; ACCESS Team: Johns Hopkins University; NASA Goddard Space Flight Center; Space Telescope Science Institute; University of California, Berkeley; University of California, Los Angeles; The Harvard Smithsonian Center for Astrophysics (CfA)

— 8:50 A.M. **Disk-integrated Measurements of the Moon in the Ultraviolet**
Greg Holsclaw, Martin Snow, William McClintock, Tom Woods—University of Colorado

Presentation not available **Progress Towards an Absolute Calibration of Lunar Irradiance at Reflected Solar Wavelengths**
Claire Cramer, Steven Brown, Keith Lykke, Allan Smith—NIST; John McGraw, Peter Zimmer—University of New Mexico; Tom Stone—U.S. Geological Survey; Emilio Falco—Smithsonian Astrophysical Observatory

— 9:30 A.M. **How Earth's Atmosphere Affects Ground-based Celestial Calibrations, and How to Correct for It**
John McGraw, Peter Zimmer, Daniel Zirzow, Jeffrey Karle—University of New Mexico; John Woodward, Claire Cramer, Keith Lykke—National Institute of Standards and Technology

— 9:50 A.M. **Two New Instruments to Calibrate the Visible Sky**
Peter Zimmer, John McGraw, Daniel Zirzow—University of New Mexico; John Woodward, Keith Lykke, Claire Cramer—National Institute of Standards and Technology

— 10:10 A.M. to 10:40 A.M. Poster and Exhibit Viewing Break

Sensor Calibration for Ground-Based and Airborne Radiometric Measurements

Special equipment, techniques, algorithms, and other technical subjects pertaining to Calibration and Characterization of remote sensing instruments for ground-based and airborne radiometric measurements.

Session Chair: James Peterson, USU/Space Dynamics Laboratory

— 10:45 A.M. **Use of Fourier Transforms and Auto-correlation to Identify Column Integrated CO2 Mixing Ratio from a Continuous Wave Lidar System for the ASCENDS Mission**
Doug McGregor, Jeremy Dobler, Jeff Pruitt, Grant Matthews—ITT Exelis

— 11:05 A.M. **Differential Absorption LIDAR for Greenhouse Gas Detection**
Stephen Maxwell, Kevin Douglass, Daniel Samarov, David Plusquellic—National Institute of Standards and Technology

— 11:25 A.M. **Absolute Radiance Re-calibration of FIRST**
Harri Latvakoski, Jason Swasey, Kendall Johnson—USU/Space Dynamics Laboratory; Martin Mylnczak, David Johnson, Richard Cageao—NASA Langley Research Center

— 11:45 A.M. **Calibration of the National Ecological Observatory Network's Airborne Observation Platform**
Nathan Leisso, Thomas Kampe, Bryan Karpowicz, Keith Krause —National Ecological Observatory Network

Wednesday, August 29

— 12:05 P.M. to 1:05 P.M. Lunch Provided

Calibration of Microwave Radiometers and other Microwave Instruments

Calibration and characterization issues associated with making radiometric measurements within the microwave band, including the comparison or fusion of microwave data with data obtained within the optical bands.

Session Chair: Randy Jost, Ball Aerospace

— 1:10 P.M. **SI-traceable Microwave Brightness-Temperature Standards Development at NIST**
David Walker, Robert Billinger—NIST; Dazhen Gu, James Randa, Derek Houtz—University of Colorado

Presentation not available **Cross Scan Asymmetry of AMSU-A Window Channels: Characterization, Correction and Verification**
Wenze Yang, Isaac Moradi, Chabitha Devaraj—University of Maryland/ Earth System Science Interdisciplinary Center (ESSIC)/Cooperative Institute for Climate and Satellites; Huan Meng, Ralph Ferraro—NOAA/NESDIS/STAR

— 1:50 P.M. to 1:55 P.M. Break

JPSS Spotlight—Part 1

Session Chair: Fuzhong Weng, NOAA/STAR/NESDIS

— 2:00 P.M. **JPSS Overview**
Mitch Goldberg—NOAA

— 2:20 P.M. **Operational Calibration Support to NPP/JPSS Program**
Fuzhong Weng—NOAA STAR/NESDIS

— 2:40 P.M. **Overview of VIIRS Postlaunch Calibration/Validation**
Changyong Cao—NOAA; Frank Deluccia—The Aerospace Corporation; Jack Xiong—NASA

— 3:00 P.M. **Overview of Post-launch NPP CrIS SDR Calibration and Validation**
Yong Han—NOAA/STAR

— 3:20 P.M. **OMPS Nadir Calibration and Characterization from Early Orbit Images**
Chunhui Pan—University of Maryland; Fuzhong Weng, Xiangqian Wu, Larry Flynn—NOAA STAR; Glen Jaross, Michael Haken—SSAI; Scott Janz—NASA Goddard Space Flight Center, Matt Kowalewski—Universities Space Research Association

— 3:40 P.M. to 3:50 P.M. Break

JPSS Spotlight—Part 1 (cont.)

Presentation not available **The Advanced Technology Microwave Sounder (ATMS): The First 10 Months On-Orbit**
Edward Kim—NASA Goddard Space Flight Center; C-H Joseph Lyu, NASA Goddard Space Flight Center/IMSG@NASA/GESTAR; William Blackwell, R. Vince Leslie—MIT Lincoln Laboratory; Neal Baker—The Aerospace Corporation; Tsan Mo, Ninghai Sun, Li Bi—NOAA NESDIS; Kent Anderson, Mike Landrum—Northrop Grumman Electronic Systems; Giovanni De Amici, Degui Gu, Alex Foo—Northrop Grumman Aerospace Systems; Wael Ibrahim—Raytheon; Kris Robinson—USU/Space Dynamics Laboratory; Lynn Chidester—Self; James Shiue—NASA Goddard Space Flight Center/Stinger Ghaffarian Technologies (SGT, Inc.)

— 4:10 P.M. **Performance of CrIS on NPP**
David Tobin, Hank Revercomb, Robert Knuteson, Dan Deslover, Joe Taylor, Lori Borg, Fred Best—University of Wisconsin-Madison

— 4:30 P.M. **CrIS Calibration and Validation**
Larrabee Strow, Howard Motteler, Paul Schou, Scott Hannon—University of Maryland, Baltimore County

— 4:50 P.M. **VIIRS On-orbit Spectral Throughput Degradation: A Physical Model with Specific Guidance on Handling Sensor Characteristics for EDR Development**
Bruce Guenther—Stellar Solutions

— 5:10 P.M. **Post-launch Radiometric and Spectral Calibration Assessment of NPP/CrIS by Comparing CrIS with VIIRS, AIRS, and IASI**
Likun Wang, University of Maryland/ Earth System Science Interdisciplinary Center (ESSIC)/Cooperative Institute for Climate and Satellites; Yong Han, Fuzhong Weng, Mitch Goldberg—NOAA/NESDIS/STAR; Denis Tremblay—ERT, Inc.

Wednesday, August 29

— 6:30 P.M. to 8:30 P.M. Barbeque in Logan Canyon (Spring Hollow Group Site B)

Thursday, August 30 Held at the Space Dynamics Laboratory Calibration Building

— 7:30 A.M. to 8:00 A.M. Continental Breakfast

— 8:00 A.M. Conference Announcements

JPSS Spotlight—Part 2

Session Co-chairs: Bruce Guenther—Stellar Solutions and Heather Kilcoyne—NOAA

— 8:10 A.M. **Root Cause Determination of On-orbit Degradation of the VIIRS Rotating Telescope Assembly**
Martin Ciofalo, Chung-Tse Chu, James Barrie, Peter Fuqua, Michael Meshishnek, John Chaney, Robert Moision—The Aerospace Corporation; Larissa Graziani—NASA Goddard Space Flight Center

Presentation not available **On-Orbit Calibration of the Suomi-NPP VIIRS Day Night Visible Imaging Band**
Thomas Schwarting, Shihyan Lee, Jeffrey McIntire—Sigma Space Corporation; Jack Xiong, James Butler—NASA Goddard Space Flight Center

— 8:50 A.M. **Assessment of CrIS Radiometric Accuracy using Community Radiative Transfer Model and Double Difference Approach**
Yong Chen—Colorado State University/Cooperative Institute for Research in the Atmosphere (CIRA); Yong Han, Fuzhong Weng—NOAA/STAR

— 9:10 A.M. **Cross-track Infrared Sounder (CRIS) Instrument In-flight Performance**
Vladimir Zavyalov, Mark Esplin, Mark Greenman, Deron Scott, Brandon Graham, Charles Major—USU/Space Dynamics Laboratory; Yong Han—NOAA/NESDIS/STAR

— 9:30 A.M. **Preliminary Comparison of Radiometric Calibration Performance among CrIS, AIRS and IASI Using GSICS GEO-LEO Inter-calibration**
Fangfang Yu—ERT, Inc./NOAA, Xiangqian Wu, Yong Han—NOAA/NESDIS/STAR

— 9:50 A.M. **VIIRS Radiometric Calibration for Solar Reflective Bands: Antarctic Dome C Site and Simultaneous Nadir Overpass Observations**
Slawomir Blonski—University of Maryland; Changyong Cao, Xi Shao—NOAA/NESDIS/STAR; Sirish Uprety—Colorado State University

— 10:10 A.M. to 10:40 A.M. Break

— 10:40 A.M. to 11:00 A.M. Restricted Session: Section 1 Check-in

Thursday, August 30

Poster Session

Poster presentations are displayed in room 207/205. Posters may be viewed during the continental breakfasts, lunches and refreshment breaks. Authors present during the following times:

— **Tuesday, August 28** 9:50 — **Wednesday, August 29** 10:10

ABI Radiance Calibration Methodology and Prototype Model Results Presentation not available
Kim Slack, John van Naarden, Roy Glavin, Joseph Lawrence—ITT Exelis

Absolute Spectroradiometric Calibration of Standard Stars Presentation not available
John Woodward, Claire Cramer, Keith Lykke—National Institute of Standards and Technology; John McGraw, Pete Zimmer—University of New Mexico; Christopher Stubbs—Harvard University; Emilio Falco—Harvard-Smithsonian Center for Astrophysics

Characterization of Small Industrial Temperature Sensors
Harri Latvakoski, Shane Topham—USU/Space Dynamics Laboratory

Correlation, Coherence and Accuracy Explained Presentation not available
David Pollock—University of Alabama-Huntsville

CrIS Sensor Temperature Effects on CrIS Radiometric Performance
Mark Esplin, Kevin Grant, Vladimir Zavyalov, Deron Scott—USU/Space Dynamics Laboratory

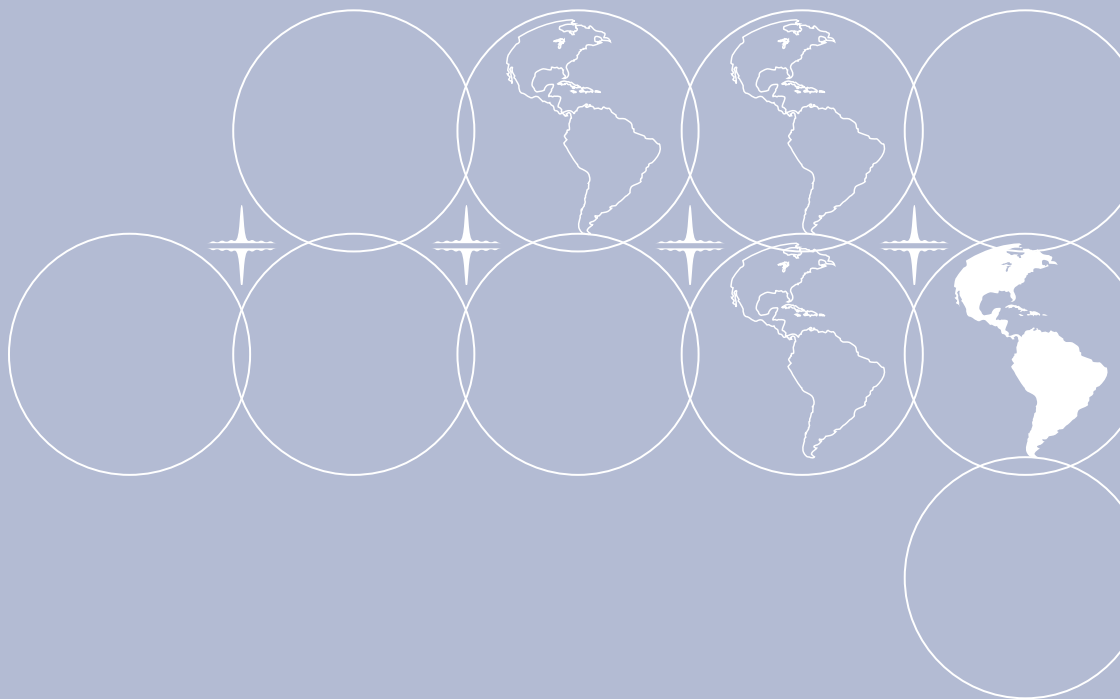
Cross-Calibration over Desert Sites: Description, Methodology and Operational Implementation
Sophie Lachérade, Bertrand Fougnie, Patrice Henry, Philippe Gamet—CNES

Early Assessment of VIIRS Onboard Blackbody Performance Presentation not available
Kwofu Chiang—Sigma Space Corp.; Xiaoxiong Xiong—NASA Goddard Space Flight Center

Expansion of the Temperature and Wavelength Ranges of NIST Infrared Spectroradiometry Capabilities for Thermal Sources and Materials Presentation not available
Sergey Mekhontsev, Leonard Hanssen—NIST; Vladimir Khromchenko—USU/Space Dynamics Laboratory

Global Precipitation Measurement Microwave Imager (GMI) Pre-flight Calibration Performance
David Draper and David Newell—Ball Aerospace & Technologies Corp.

Implementation of a First-Principles VisNIR Radiometer Presentation not available
James Coles—Jet Propulsion Laboratory; Mark Helmlinger—Labsphere



Poster Session (cont.)

Long-term Calibration Performance of MODIS Reflective Solar Bands Presentation not available
Junqiang Sun, Hongda Chen, Xu Geng, Jason Choi, Mike Chu—Sigma Space Corp.; Amit Angal—Science Systems and Applications, Inc.; Xiaoxiong Xiong—NASA Goddard Space Flight Center

Long-term Calibration Performance of MODIS Thermal Emissive Bands
Brian Wenny, Aisheng Wu, Zhipeng Wang, Yonghong Li, Na Chen—Sigma Space Corp.; Sriharsa Madhavan—Science Systems and Applications Inc.; Xiaoxiong Xiong—NASA Goddard Space Flight Center

On Orbit White Noise, SNR and NEdT characterization for the Suomi—NPP VIIRS Presentation not available
Alin Tolea, Thomas Schwarting, Jeffrey McIntire, Hassan Oudrari—Sigma Space Corporation/NASA/NICST

Predicting the Radiometric Biases between ABI and VIIRS Due to Spectral Response Function Differences
Aaron Pearlman, David Pogorzala—Integrity Applications Incorporated; Changyong Cao—NOAA/NESDIS/STAR

Pre-launch Calibration of the Landsat Data Continuity Mission Thermal Infrared Sensor
Brian Wenny, Matt Montanaro—Sigma Space Corp.; Kurt Thome, Dennis Reuter, Ramsey Smith—NASA Goddard Space Flight Center; Zelalem Tesfaye—M.E.I.; Allen Lunsford—Catholic University

Radiometric Calibration—The Theory, Equations and Illustrations Presentation not available
David Pollock—University of Alabama-Huntsville

Radiometric Performances of COMS MI for First One Year
Jae-Gwang Kim, Byung-Il Lee, Young-Won Park, Seung-Hee Sohn, Hee-Sang Lee—Korea Meteorological Administration/ National Meteorological Satellite Center

Recent Developments in Infrared Reflectometry at NIST Presentation not available
Leonard Hanssen, Sergey Mekhontsev—NIST; Jinan Zeng, Vladimir Khromchenko—USU/Space Dynamics Laboratory

Relative Trends of AIRS and IASI Radiometric Calibrations
Denis Elliott, Hartmut Aumann—Jet Propulsion Laboratory/California Institute of Technology; Larrabee Strow—University of Maryland, Baltimore County

Removal of the Adjacency Effect in Nabran Test Site Designated for Vicarious Calibration of Satellite Sensors
Hikmat Asadov, Javid Hashimov—National Aerospace Agency, Azerbaijan Presentation not available

Retrieval Error Budget Estimation using Error Consistency Analysis Scheme Presentation not available
Daniel Zhou, Allen Larar, Xu Liu—NASA Langley Research Center

Satellite Sensor Validation Utilizing Airborne Field Campaign Measurements Presentation not available
Allen Larar, Daniel Zhou, Xu Liu—NASA Langley Research Center; William Smith—HU/UW

Spectral, Spatial, and Polarmetric Calibration and Characterization of the Airborne Multiangle SpectroPolarimetric Imager Presentation not available
Brian Rheingans, Carol Bruegge—Jet Propulsion Laboratory; Mark Helmlinger—Labsphere

Standard Radiometric Facility for Earth Observation Instruments Presentation not available
Valeriy Gavrilov, Aleksandra Katysheva, Boris Khlevnoy, Boris Lisyansky, Svetlana Morozova, Sergey Ogarev, Aleksandr Panfilov, Nikolay Parfentyev, Andrey Pusanov, Viktor Sapritsky, Maxim Solodilov—All-Russian Research Institute for Optical and Physical Measurements (VNIIOFI)

Test and Assessment of a New Quantum Cascade Laser at 23 μm for Applications in the Longwave Infrared Region
Jinan Zeng—USU/Space Dynamics Laboratory; Leonard Hanssen—National Institute of Standards and Technology

Translating and Evaluating GOES-R Product Requirements According to International Standards
Raghu Kacker—NIST; Aaron Pearlman—IAI; Raju Datla—RTI

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