

FTS/HISE

Fourier Transform Spectroscopy/ Hyperspectral Imaging and Sounding of the Environment

Fourier Transform Spectroscopy

January 31 – February 3, 2005

Hyperspectral Imaging and Sounding of the Environment (formerly ORS)

January 31 – February 3, 2005

Collocated Topical Meetings and Tabletop Exhibits

[Hilton Alexandria Mark Center](#)
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The HISE topical meeting would like to acknowledge the generous support of:



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About FTS

January 31 – February 3, 2005

Fourier transform spectrometry is the spectroscopic technique of choice in all research areas that require high accuracy, sensitivity, and resolution, which continues to grow in application and utilization. This is especially true for new research areas, such as meteorology and chemical microscopy, where such attributes are mandatory. This FTS Topical Meeting is the only global conference on Fourier transform spectrometry covering the whole range of FTS technology and applications. Its scope will include laboratory spectroscopy, Earth and planetary remote sensing, and astronomy.

FTS Meeting Topics

This FTS topical meeting will welcome all scientists who use or develop Fourier transform spectroscopy, which is the technique of choice in all research areas that require wide spectral ranges, high accuracy, sensitivity, and resolution. Its scope will include laboratory, Earth, planetary and astronomical spectroscopy. This meeting is the only global conference covering from the submillimeter to the ultra-violet, FTS instrumental development, technology and applications.

Topics To Be Considered:

- **Instruments:** New FTS concepts and designs; FTS in the submillimeter, infrared, visible, and ultraviolet; laboratory instruments; space-based instruments; astronomical instruments; new technologies for FTS; Time-resolved FTS; and imaging FTS.
- **Analysis:** New methods for photometry, lineshape determination, improving frequency accuracy and sensitivity, as well as improvements in atmospheric retrievals of gases and particulates.
- **Applications:** Atomic and molecular spectroscopy, Raman FT spectroscopy, time-resolved Fourier transform spectroscopy, biological and in-situ spectroscopy, atmospheric remote sensing, earth remote sensing from space, planetary remote sensing, and spectroscopy of astronomical sources.

Who should attend:

Industrial, academic and government scientists and engineers.

About HISE

About HISE

January 31 – February 3, 2005

The unprecedented advancement of remote sensing imaging and sounding by passive and active measurement technologies during and beyond this decade will provide unprecedented monitoring and understanding of our earth (land and ocean)-atmosphere system (E-AS). The uniqueness of these new observations will challenge scientists and users in all disciplinary areas and require new approaches for managing, processing and utilizing the data, including the integration of observations from different sensor constellations to maximize the information which these new sensors will provide. Today, a number of advanced hyperspectral imaging and sounding instruments are on NASA and European research instruments, and some of them will evolve in a few years into operational imaging and sounding systems, for example NPOESS, METOP, and GOES-R. Passive hyperspectral imaging and sounding data provide unique and independent scale of information such as spatial resolution and spectral resolution required to measure and monitor the intricate characteristic of E-AS. Where sounding information is required to study atmosphere evolution, imaging information is necessary to investigate land and coastal-ocean ecosystems. Complementary active sensors due to its high signal sensitivity, has a key role in E-AS monitoring because they provide additional microphysical insights into the small targets exist within the E-AS and also provides an important source of information for validating other retrievals from passive sensors. Synergistic uses of imaging and sounding, and passive and active through collocation processing, in theory, will provide complementary information content to enhance knowledge about the state of E-AS.

The focus of this newly expanded topical meeting, to be held in conjunction with OSA FTS Topical Meeting, is the full scope of research and applications in the atmospheric, land and coastal-ocean disciplinary areas, The 2005 meeting goals are to the discuss issues of " *Determination of cloud and aerosol properties from active and passive remote sensing observations and atmospheric soundings of temperature, moisture and ozone in the presence of clouds* ", " *Land remote sensing study to monitoring fire hazard, land uses, and develop biophysical products for resource management, agricultural and for the ecological applications* " and " *Coastal-ocean remote sensing for monitoring water quality, harmful algae blooms and biological activity (.i.e. ocean color)* " .

HISE Meeting Topics

Topics to be considered include:

Cloud/Aerosols Theme

- Cloud in-situ measurements
- Cloud active/passive remote sensing measurements
 - Cloud detection and macro-physical property retrievals
 - Cloud micro-physical property retrievals, including phase discrimination
- Ice cloud study
- Cloudy forward radiative transfer models
- Retrieval of water vapor and temperature profiles in cloudy atmospheres
- Aerosol retrievals, air quality
- Cloud clearing for data assimilation and retrieval
- Active and passive synergistic cloud analysis/study
- Imaging and sounding synergistic cloud analysis/study
- General radiative transfer modeling
- Retrieval of atmospheric profile, surface property, trace gases, aerosols and precipitation

Land Theme

- Biophysical land variable derivation
 - Vegetation product set
 - Land surface type and characterization
 - Spectral property of land surfaces
- Fire hazard and special event monitoring and management
- Synergistic infrared and microwave imaging study of land resource
- Collection, data processing, distribution and general utilization of land remote sensing data
- Land resource preservation and management

Coastal - Ocean Theme

- Measurement strategies
- Monitoring harmful algae blooms
- Monitoring phytoplankton biomass
- Monitoring coastal and oceanic hazard
- Atmospheric Corrections

General Theme

- All relevant passive, active, imaging, and sounding hyperspectral remote sensing programs, missions, field campaigns, data processing, applications, validations, utilization, education, outreach and users' feedback are welcome

FTS Invited Speakers

The preliminary list of invited speakers includes:

JMA3, **Atmospheric Chemistry Environment (ACE): Mission Overview**, *Peter Bernath, Univ. of Waterloo, Canada.*

FMB1, **Thermal Emission Spectrometer (TES) on Mars Global Surveyor Spacecraft**, *Phil Christensen; Arizona State Univ., USA.*

FMC1, **Recent Results with FTS in Astronomy**, *Jean-Pierre Maillard; Institut d'Astrophys. de Paris, France.*

FMD1, **FTS Calibration: Demonstrated Absolute Accuracy for IR Remote Sensing and Future for Monitoring Climate**, *Henry E. Revercomb, David C. Tobin, Robert O. Knuteson, Fred A. Best, 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; Univ. of Wisconsin at Madison, USA.*

FMD2, **Spaceborne FTS Programs Since ADEOS/IMG**, *Makoto Suzuki; JAXA/EORC, Japan.*

FTuA1, **The Femtosecond Frequency Comb Techniques**, *Thomas Udem; Max-Planck-Institut, Germany.*

FTuA2, **Femtosecond Frequency Combs: New Trends for Fourier Transform Spectroscopy**, *Nathalie Picqué, Guy Guelachvili; Lab de Photophysique Moléculaire, CNRS, France.*

FTuB1, **Resolution and Far-Infrared Magneto-Optical FTS with Synchrotron Light**, *Laszlo Mihaly¹, G. Lawrence Carr², Diyar Talbayev³; ¹SUNY at Stony Brook, USA, ²Brookhaven Natl. Lab, USA, ³College of William and Mary, USA.*

FTuC1, **MIPAS, the Michelson Interferometer for Passive Atmospheric Sounding for the EnviSat Satellite**, *Martin Endemann; ESA-ESTEC, Netherlands Antilles.*

FTuC2, **Infrared Beamlines at the Canadian Light Source**, *A. R. McKellar; Natl. Res. Council of Canada, Canada.*

FWA1, **A VUV-EUV High Resolution Fourier Transform Spectrometer without a Beam Splitter**, *Denis Joyeux¹, Daniel Phalippou¹, Jean-Claude Rodier¹, Nelson de Oliveira², Laurent Nahon², Francois Polack², Michel Vervloët³; ¹Lab Charles Fabry, Inst. d'Optique and CNRS, France, ²Synchrotron SOLEIL, France, ³Lab de Photophysique*

Moléculaire, CNRS and Univ. Paris 11, France.

FWB1, Fourier Transform Emission Spectroscopy of the Atmosphere with the MIPAS Instrument on Envisat, *Bruno Carli; Istituto di Fisica Applicata, Italy.*

FWC1, Combining the Multiplex Advantage of FT-Spectrometers with the Sensitivity of the Cavity Ring Down Technique, *Richard Engel¹, Rens Zijlmans¹, Edward Hamers², Daan Schram¹; ¹Eindhoven Univ. of Technology, The Netherlands, ²AKZO-NOBEL Chemicals, The Netherlands.*

FWC2, Quality Assessment of Laboratory and Space FT Measurements, *Georg Wagner, Manfred Birk; DLR Inst. for Remote Sensing Technology, Germany.*

FWD1, Fourier Transform Spectrometer Instrument Considerations for High Spatial and Spectral Resolution Hyperspectral Imaging, *Henry Buijs¹, Francois Chateaneuf², Raphael Desbien²; ¹ABB BOMEM Inc., Canada, ²ABB BOMEM Inc., USA.*

FThA1, The Tropospheric Emission Spectrometer: On-Orbit Experiences, *Michael Gunson; JPL, USA.*

FThA2, Fourier Transform Spectroscopy from Balloon for Remote Sensing of the Stratosphere and the Troposphere, *Claude Camy-Peyret; LPMA/CNRS, France.*

FThB1, All Sky Extrasolar Planet Searches with Multi-Object Dispersed Fixed-Delay Interferometer in Optical and Near IR, *Jian Ge; Univ. of Florida, USA.*

FThB2, CIRS: The Composite Infrared Spectrometer on Cassini, *D. E. Jennings¹, F. M. Flasar¹, G. L. Bjoraker¹, P. N. Romani¹, A. A. Simon-Miller¹, J. C. Brasunas¹, V. G. Kunde², C. A. Nixon², R. K. Achterberg³, R. Carlson³, A. A. Mamoutkine³; ¹NASA/Goddard Space Flight Ctr., USA, ²Univ. of Maryland, USA, ³Space Science and Applications Inc., USA.*

HISE Invited Speakers

The preliminary list of invited speakers includes:

JMA4, **EAQUATE—An International Experiment for Hyperspectral Atmospheric Sounding Validation**, *William L. Smith, NASA/Goddard Space Flight Ctr., USA*

HMB1, **Coastal Waters Imaging Capability on GOES-R Hyperspectral Environmental Suite: Characteristics and Applications**, *Christopher Brown, NOAA, USA,*

HMB2, **Toward Continuous Remotely Sensed Cloud Microphysical Structure for the Calculation of Heating Rate Profiles**, *Tim Schmit¹, James Gurka¹, W. P. Menzel¹, Jun Li²;*

¹NOAA/NESDIS, USA, ²CIMSS, Univ. of Wisconsin at Madison, USA

HMC1, **Infrared Hyperspectral Sensor/RTA Validation: The AIRS Experience**, *Larrabee Strow, Univ. of Maryland, Baltimore County, USA*

HMC2, **Cloud Detection, Temperature and Water Vapor Retrieval from Hyperspectral Infrared Sounder Observations**, *Carmine Serio^{1,2}, Annamaria Carissimo², Giuseppe Grieco², Guido Masiello³; ¹INFM, Italy, ²Univ. degli Studi della Basilicata, Italy, ³IMAA/CNR, Italy*

HMD1, **Using Remote Sensing to Deduce the Aerosol Direct and Indirect Radiative Forcing of Climate**, *Oregon State Univ., USA*

HMD2, **Measuring Aerosol Single Scattering Albedo with Combined HySPAR and HSRL**, *Yongxiang Hu¹, Chris Hostetler¹, J. Hair¹, David Flittner¹, Steve Jones², F. Iannarilli³, Ping Yang³; ¹NASA Langley Res. Ctr., USA, ²Aerodyn Corp., USA, ³Texas A&M Univ., USA*

HTuA1, **Study of Cloud Microphysics and Thermodynamics Using MODIS Atmospheric Products**, *Prof. Harshvardhan, Robert N. Green, Purdue Univ., USA*

HTuA2, **Spatial and Temporal Distribution of Tropospheric Clouds Observed by MODIS on-board the Terra and Aqua Satellites**, *Michael King, Steven Platnick, NASA/Goddard Space Flight Ctr., USA*

HTuB1, **A Methodology for Assessing Pixel-Level Uncertainties in Global MODIS Cloud Optical and Microphysical Retrievals** ,

Steven Platnick, NASA, USA

HTuC1, Applications of the GOES-R HES (Hyperspectral Environmental Suite) Infrared Measurements, *Mark Miller¹, Eli Mlawer²; ¹Brookhaven Natl. Lab, USA, ²Atmospheric and Environmental Research Inc., USA*

HTuC2, TBA, Gerald Mace, Univ. of Utah, USA

HWA1, The Use of Active Remote Sensing of Constrain Cloud Models, *Helene Chepfer, LMD/IPSL, France*

HWC1, Estimating Cloud Properties from Passive Near-Infrared Spectral Observations, *Daniel, NOAA Aeronomy Lab, USA*

HWC2, Retrieving Cloud Microphysical Properties Using High Spectral Resolution Observations in the 8-13 and 3-5 Micron Windows, *David Turner, Pacific Northwest Natl. Lab, USA*

HThA1, Development of Ice Cloud Microphysical and Optical Models at Visible to Far-Infrared Wavelengths, *Bryan A. Baum¹, Ping Yang², Andrew J. Heymsfield³; ¹NASA Langley Res. Ctr., USA, ²Texas A&M Univ., USA, ³Natl. Ctr. for Atmospheric Res., USA*

FTS Publications

Technical Digest

The *FTS/HISE Technical Digest* CD-ROM will contain the camera-ready summaries of papers presented during the meetings. At the meetings, each registrant will receive the *FTS/HISE Technical Digest* CD-ROM. Extra copies can be purchased at the meeting for a special price of US\$45.

HISE Publications

Technical Digest

The *FTS/HISE Technical Digest* CD-ROM will contain the camera-ready summaries of papers presented during the meetings. At the meetings, each registrant will receive the *FTS/HISE Technical Digest* CD-ROM. Extra copies can be purchased at the meeting for a special price of US\$45.

FTS Agenda of Sessions

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Monday, January 31, 2005

Time	Event/Location
8:00 AM - 8:15 AM	Opening Remarks <i>Plaza Ballroom A</i>
8:15 AM - 8:30 AM	OSA Overview
8:30 AM - 10:30 AM	JMA , Joint FTS/HISE Session <i>Plaza Ballroom A</i>
10:30 AM - 11:00 AM	Coffee Break <i>Plaza Ballroom B</i>
10:30 AM - 4:00 PM	Exhibits <i>Plaza Ballroom B</i>
11:00 AM - 12:20 PM	FMB , Fourier Session <i>Plaza Ballroom A</i>
12:20 PM - 1:50 PM	Lunch Break (on your own)
1:50 PM - 3:30 PM	FMC , Michelson Session <i>Plaza Ballroom A</i>
3:30 PM - 4:00 PM	Coffee Break <i>Plaza Ballroom B</i>
4:00 PM - 5:40 PM	FMD , Fellgett Session <i>Plaza Ballroom A</i>

Tuesday, February 01, 2005

Time	Event/Location
8:30 AM - 10:30 AM	FTuA , Jacquinot Session <i>Plaza Ballroom A</i>
10:30 AM - 11:00 AM	Coffee Break <i>Plaza Ballroom B</i>

10:30 AM - 5:30 PM	Exhibits <i>Plaza Ballroom B</i>
11:00 AM - 12:20 PM	FTuB , Pierre Connes Session <i>Plaza Ballroom A</i>
12:20 PM - 1:50 PM	Lunch Break (on your own)
1:50 PM - 3:30 PM	FTuC , Janine Connes Session <i>Plaza Ballroom A</i>
3:30 PM - 5:30 PM	FTuD , FTS Poster Session <i>Plaza Ballroom B</i>
3:30 PM - 4:00 PM	Coffee Break <i>Plaza Ballroom B</i>
6:00 PM - 8:00 PM	Conference Reception <i>Terrace Room</i>

Wednesday, February 02, 2005

Time	Event/Location
8:30 AM - 10:30 AM	FWA , Forman Session <i>Plaza Ballroom A</i>
10:30 AM - 4:00 PM	Exhibits <i>Plaza Ballroom B</i>
10:30 AM - 11:00 AM	Coffee Break <i>Plaza Ballroom B</i>
11:00 AM - 12:20 PM	FWB , Mertz Session <i>Plaza Ballroom A</i>
12:20 PM - 1:50 PM	Lunch Break (on your own)
1:50 PM - 3:30 PM	FWC , Strong Session <i>Plaza Ballroom A</i>
3:30 PM - 4:00 PM	Coffee Break <i>Plaza Ballroom B</i>
4:00 PM - 5:20 PM	FWD , Hanel Session <i>Plaza Ballroom A</i>

Thursday, February 03, 2005

Time	Event/Location
8:30 AM - 10:30 AM	FThA , Farmer Session <i>Plaza Ballroom A</i>
10:30 AM - 11:00 AM	Coffee Break <i>Plaza Ballroom B</i>

11:00 AM - 12:20 PM **FThB**, Cooley-Tukey Session
Plaza Ballroom A

12:20 PM - 12:30 PM FTS Closing Remarks
Plaza Ballroom A

HISE Agenda of Sessions

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Monday, January 31, 2005

Time	Event/Location
8:00 AM - 8:15 AM	Opening Remarks <i>Plaza Ballroom A</i>
8:00 AM - 10:30 AM	JMA , Joint FTS/HISE Session <i>Plaza Ballroom A</i>
8:15 AM - 8:30 AM	OSA Overview
10:30 AM - 11:00 AM	Coffee Break <i>Plaza Ballroom B</i>
10:30 AM - 4:00 PM	Exhibits <i>Plaza Ballroom B</i>
11:00 AM - 12:40 PM	HMB , Satellite Sounding and Imaging I <i>Plaza Ballroom C</i>
12:20 PM - 1:50 PM	Lunch Break (on your own)
1:50 PM - 3:30 PM	HMC , Satellite Sounding and Imaging II <i>Plaza Ballroom C</i>
3:30 PM - 4:00 PM	Coffee Break <i>Plaza Ballroom B</i>
4:00 PM - 5:40 PM	HMD , Aerosol Remote Sensing <i>Plaza Ballroom C</i>

Tuesday, February 01, 2005

Time	Event/Location
8:30 AM - 10:30 AM	HTuA , Cloud Remote Sensing I <i>Plaza Ballroom C</i>
10:30 AM - 11:00 AM	Coffee Break <i>Plaza Ballroom B</i>
10:30 AM - 5:30 PM	Exhibits <i>Plaza Ballroom B</i>
11:00 AM - 12:40 PM	HTuB , Satellite Sounding Applications I <i>Plaza Ballroom C</i>
12:20 PM - 1:50 PM	Lunch Break (on your own)
1:50 PM - 3:30 PM	HTuC , Surface-Based Cloud Sensing <i>Plaza Ballroom C</i>
3:30 PM - 5:30 PM	HTuD , HISE Poster Session <i>Plaza Ballroom B</i>
3:30 PM - 4:00 PM	Coffee Break <i>Plaza Ballroom B</i>
6:00 PM - 8:00 PM	Conference Reception <i>Terrace Room</i>

Wednesday, February 02, 2005

Time	Event/Location
8:30 AM - 10:30 AM	HWA , Cloud Remote Sensing II <i>Plaza Ballroom C</i>
10:30 AM - 4:00 PM	Exhibits <i>Plaza Ballroom B</i>
10:30 AM - 11:00 AM	Coffee Break <i>Plaza Ballroom B</i>
11:00 AM - 12:20 PM	HWB , Satellite Sounding Applications II <i>Plaza Ballroom C</i>
12:20 PM - 1:50 PM	Lunch Break (on your own)
1:50 PM - 3:30 PM	HWC , Cloud Remote Sensing III <i>Plaza Ballroom C</i>
3:30 PM - 4:00 PM	Coffee Break <i>Plaza Ballroom B</i>
4:00 PM - 5:40 PM	HWD , IR Remote Sensing <i>Plaza Ballroom C</i>

Thursday, February 03, 2005

Time	Event/Location
8:30 AM - 10:30 AM	HThA , Ice Cloud Remote Sensing <i>Plaza Ballroom C</i>
10:30 AM - 11:00 AM	Coffee Break <i>Plaza Ballroom B</i>
11:00 AM - 12:40 PM	HThB , Algorithm Development and Validation <i>Plaza Ballroom C</i>
12:40 PM - 12:50 PM	HISE Closing Remarks <i>Plaza Ballroom C</i>

FTS Agenda and Abstracts

Joint FTS/HISE

Monday, January 31, 2005

Plaza Ballroom A

8:00 a.m.–10:30 a.m.

JMA • Joint FTS/HISE Session

Dieter Hausamann; German Aerospace Res. Est. DLR, Germany, Presider

JMA1 • 8:00 a.m.

Opening Remarks

JMA2 • 8:15 a.m.

OSA Overview

JMA3 • 8:30 a.m. Invited

Atmospheric Chemistry Experiment (ACE): Mission Overview

Peter Bernath; Univ. of Waterloo, Canada.

ACE is a Canadian satellite mission that will provide measurements leading to an improved understanding of the chemical and dynamical processes that control the distribution of ozone in the stratosphere.

JMA4 • 9:10 a.m. Invited

EAQUATE—An International Experiment for Hyperspectral Atmospheric Sounding Validation

William L. Smith; Hampton Univ., USA.

The international experiment called EAQUATE (European AQUA Thermodynamic Experiment) was held this past September in Italy and the UK to demonstrate certain ground-based and airborne systems useful for validating hyperspectral satellite sounding observations.

JMA5 • 9:50 a.m.

Concept of a Demonstrator for GLORIA

Felix Friedl-Vallon¹, Martin Riese²; ¹Inst. für Meteorologie und Klimaforschung, Forschungszentrum Karlsruhe, Germany, ²Inst. für Chemie der Geosphäre, Forschungszentrum Jülich, Germany.

This paper presents conceptual work for the Global limb Radiance Imager of the Atmosphere (GLORIA) project. The instrument will be a combination of a large thermal IR focal plane array and a low-resolution FTS.

JMA6 • 10:10 a.m.

Ground-Based Remote Sensing of the Cloudy Atmosphere—Towards an All-Encompassing Algorithm

Ulrich Löhnert, Susanne Crewell, Annika Schomburg; Meteorological Inst., Germany.

An integrated retrieval technique for determining the thermodynamic profile of the atmosphere together with macro-/and micro-physical properties of liquid clouds is presented. The method provides an uncertainty estimate, which is confirmed using independent radiosonde measurements.

Plaza Ballroom B

10:30 a.m.–11:00 a.m.

Coffee Break

Plaza Ballroom B

10:30 a.m.–4:00 p.m.

Exhibits

FTS

Monday, January 31, 2005

Plaza Ballroom A

11:00 a.m.–12:20 p.m.

FMB • Fourier Session

Donald Jennings; NASA Goddard Space Flight Ctr., USA. Presider

FMB1 • 11:00 a.m. Invited

Thermal Emission Spectrometer (TES) on Mars Global Surveyor Spacecraft

Phil Christensen; Arizona State Univ., USA.

No abstract provided.

FMB2 • 11:40 a.m.

Analysis of Cross-Track Infrared Sounder (CrIS) Prelaunch Test Data

*David C. Tobin¹, Henry E. Revercomb¹, Larrabee L. Strow², Scott E. Hannon², Howard E. Motteler²;
¹Univ. of Wisconsin at Madison, USA, ²Dept. of Physics, Univ. of Maryland, Baltimore County, USA.*

Analyses of Cross-track Infrared Sounder Engineering Development Unit data collected while in bench test and thermal vacuum conditions is presented. Focus is placed on accuracy of the sensor's spectral lineshape and spectral calibration determination.

FMB3 • 12:00 p.m.

Field-Portable LWIR Imaging FTS

Martin Chamberland, Vincent Farley, André Villemaire, Jean Giroux; Telops Inc., Canada.

This paper presents the design and performance of a LWIR imaging FTS. The imaging size is 320x256 in the 8-12 μm region. An overview of the key design features is presented with the test results.

12:20 p.m.–1:50 p.m.

Lunch Break (on your own)

Plaza Ballroom A

1:50 p.m.–3:30 p.m.

FMC • Michelson Session

Bruno Carli; Istituto di Fisica Applicata, Italy, Presider

FMC1 • 1:50 p.m. Invited

Recent Results with FTS in Astronomy

Jean-Pierre Maillard; Institut d'Astrophys. de Paris, France.

Recent results with astronomical FTS on planetary atmospheres and current projects of Imaging FTS for ground-based and space telescopes are reviewed.

FMC2 • 2:30 p.m.

Imaging Fourier Transform Spectrometer for Visible Band Astronomy

Edward H. Wishnow^{1,2}, Ron Wurtz¹, Kem H. Cook¹, Dennis Carr¹, Sebastien Blais-Ouellette³, Keith Taylor³; ¹LLNL, USA, ²Univ. of California at Berkeley, USA, ³Caltech, USA.

The Livermore Visible Imaging Spectrometer is an astronomical dual-input, dual-output Michelson interferometer. The instrument has been used at the Palomar Observatory and data has been collected at both low and moderate spectral resolution.

FMC3 • 2:50 p.m.

SpIOMM: An Imaging FTS for Astronomy

Frederic Grandmont^{1,2}, Laurent Drissen¹, Anne-Pier Bernier¹, Jean-Francois Rochon¹; ¹Univ. Laval, Canada, ²ABB, Canada.

An Imaging FTS has been designed and tested at Mégantic 1.6m telescope to produce astronomical cubes of data. The interferometer modulates light from 350 to 900 nm for a 1300X1340 CCD that images 12 arcminutes.

Plaza Ballroom B
3:30 p.m.–4:00 p.m.
Coffee Break

Plaza Ballroom A
4:00 p.m.–5:40 p.m.
FMD • Fellgett Session
Nathalie Picqué; CNRS, France, Presider

FMD1 • 4:00 p.m. Invited

FTS Calibration: Demonstrated Absolute Accuracy for IR Remote Sensing and Future for Monitoring Climate

Henry E. Revercomb, David C. Tobin, Robert O. Knuteson, Fred A. Best, 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; Univ. of Wisconsin at Madison, USA.

Characterization of our airborne (Scanning High-resolution Interferometer Sounder, S-HIS) and ground-based (Atmospheric Emitted Radiance Interferometer, AERI) instruments illustrates state-of-the-art calibration performance. Application to validation of satellite radiances and to establishing climate reference observations is discussed.

FMD2 • 4:40 p.m. Invited

Japanese Spaceborne FTS Programs since ADEOS/IMG

Makoto Suzuki; JAXA/EORC, Japan.

No abstract provided.

FMD3 • 5:20 p.m.

Intracavity Laser Absorption with Time-Resolved Fourier Transform Spectroscopy

Fatou Gueye, Guy Guelachvili, Nathalie Picqué; CNRS, France.

Broadband absorption spectra displaying kilometric path lengths are recorded in the infrared. Sensitivities as low as $1.0 \times 10^{-10} \text{ cm}^{-1} \text{ Hz}^{-1/2}$ are obtained. Illustrations are given from three experimental set-up respectively centered at 1.0, 1.5 and 2.5 μm .

Tuesday, February 1, 2005

Plaza Ballroom A
8:30 a.m.–10:30 a.m.
FTuA • Jacquinet Session
G. Guelachvili; CNRS, France, Presider

FTuA1 • 8:30 a.m. Invited

The Femtosecond Frequency Comb Techniques

Thomas Udem; Max-Planck-Institut, Germany.

A femtosecond frequency comb is a simple and compact tool that allows the phase coherent comparison of radio frequencies (below 10 GHz) with optical frequencies (above 200 THz).

FTuA2 • 9:10 a.m. Invited

Sensitive Spectroscopy

Nathalie Picqué; CNRS, France.

A new approach to ultrasensitive high resolution spectroscopy is proposed.

FTuA3 • 9:50 a.m.

Instrument Line Shape of Fourier-Transform Spectrometers: Fast Integration and Correction Algorithms

Raphaël Desbiens¹, Pierre Tremblay², Jérôme Genest²; ¹ABB Bomem Inc., Canada, ²Univ. Laval, Canada.
We propose fast algorithms for the integration and removal of instrument line shapes (ILS) where the ILS scaling with wavenumbers and the sinc function are taken into account. Results are applied to correct HBr spectra.

FTuA4 • 10:10 a.m.

Experimental Study of the Instrument Line-Shape of Fourier-Transform Spectrometers Using a High Divergence, High Resolution Interferometer

Jean-Pierre Bouchard¹, Pierre Tremblay²; ¹ABB, Canada, ²Ctr. d'Optique, Photonique et Lasers, Univ. Laval, Canada.

Divergence contribution to the instrument line-shape is measured using a special high resolution, high divergence interferometer. Presence of a phase inside the ILS is observed and its effect on transmission lines is experimentally demonstrated.

Plaza Ballroom B

10:30 a.m.–11:00 a.m.

Coffee Break

Plaza Ballroom B

10:30 a.m.–5:30 p.m.

Exhibits

Plaza Ballroom A

11:00 a.m.–12:20 p.m.

FTuB • Pierre Connes Session

Pierre Tremblay; Univ. Laval, Canada, Presider

FTuB1 • 11:00 a.m. Invited

High Resolution and Far-Infrared Magneto-Optical FTS with Synchrotron Light

Laszlo Mihaly¹, G. Lawrence Carr², Diyar Talbayev³; ¹SUNY at Stony Brook, USA, ²Brookhaven Natl. Lab, USA, ³College of William and Mary, USA.

The facility for magneto-optical spectroscopy (SPS200 and Bruker 125HR spectrometers and a 16T Oxford Instruments superconducting magnet), installed at the U12IR beamline of the National Synchrotron Light Source at Brookhaven National Laboratory is reviewed.

FTuB2 • 11:40 a.m.

Correction of Phase Distortion in Spatial Heterodyne Spectroscopy (SHS)

Christoph R. Englert¹, John M. Harlander², Joel G. Cardon¹, Fred L. Roesler³; ¹NRL, USA, ²St. Cloud State Univ., USA, ³Univ. of Wisconsin at Madison, USA.

We describe a technique to measure phase distortion of SHS interferograms. We also summarize a method to correct for phase distortion which, in general, is a unique characteristic of the spectrometer.

FTuB3 • 12:00 p.m.

Atomic Oscillator Strengths in the Vacuum Ultraviolet Using Fourier Transform and Grating Spectroscopy

Gillian Nave, Zhigang Li, Craig J. Sansonetti; NIST, USA.

We describe the measurement of oscillator strengths in Fe II by radiometrically calibrating a Fourier transform spectrometer using synchrotron radiation and by using grating spectroscopy with image plates.

12:20 p.m.–1:50 p.m.

Lunch Break (on your own)

Plaza Ballroom A

1:50 p.m.–3:30 p.m.

FTuC • Janine Connes Session

Gillian Nave; Natl. Inst. of Standards and Technology, USA, Presider

FTuC1 • 1:50 p.m. Invited

MIPAS, the Michelson Interferometer for Passive Atmospheric Sounding for the EnviSat Satellite

Martin Endemann; ESA-ESTEC, Netherlands Antilles.

MIPAS (Michelson Interferometer for Passive Atmospheric Sounding) is a high resolution Fourier-Transform spectrometer flying on EnviSat. This paper gives a summary of the design and the performance of the MIPAS instrument.

FTuC2 • 2:30 p.m. Invited

Infrared Beamlines at the Canadian Light Source

A. R. McKellar; Natl. Res. Council of Canada, Canada.

The talk describes the two infrared beamlines at Canada's first synchrotron, the Canadian Light Source in Saskatoon. One is for mid-infrared bio-spectromicroscopy and industrial applications, and the other for high resolution far infrared spectroscopy.

FTuC3 • 3:10 p.m.

Imaging Fourier Transform Spectrometer in UV for the Next Solar Space Missions

Anne Millard, P. Lemaire, J. C. Vial; Inst. d'Astrophysique Spatiale, Univ. Paris Sud, France.

First results of an imaging Fourier transform spectrometer in UV. The instrument was designed to work below 150nm and to observe the solar chromosphere from space in the H-Lyman α line (121.6 nm).

Plaza Ballroom B

3:30 p.m.–4:00 p.m.

Coffee Break

Plaza Ballroom B

3:30 p.m.–5:30 p.m.

FTuD • FTS Poster Session

FTuD1 • 3:30 p.m.

Continuously Adjustable Position Sampling of Interferograms Using Parametric Solutions to Reduce Jitter Contributions

Hicham Farah, Pierre Tremblay; Univ. Laval, Canada.

The optical path difference of a Fourier-transform spectrometer is extracted using a Hilbert transform and Kalman filtered prior to the position sampling. An adaptive equalization step reduces the effects of channel mismatch.

FTuD2 • 3:30 p.m.

Instrument Parameters Estimation from ILS Characterization Measurements

Jean-Pierre Bouchard¹, Pierre Tremblay²; ¹ABB, Canada, ²Ctr. d'Optique, Photonique et Lasers, Univ. Laval, Canada.

The use of instrument line shape characterization to retrieve instrument parameters is investigated.

FTuD3 • 3:30 p.m.

Apodization Functions for Fourier Transform Spectroscopy

Margaret K. Tahic, David A. Naylor; Univ. of Lethbridge, Canada.

The three Norton-Beer apodizing functions provide a reduction in the sidelobe amplitude of FTS instrumental line shapes. We extend this series of apodizing functions to provide line shapes with FWHM ranging from 1.1 to 2.0.

FTuD4 • 3:30 p.m.

High Resolution Intracavity Laser Absorption Time-Resolved Fourier Spectroscopy Extended to 2.5 μm

Nathalie Picqué¹, Fatou Gueye¹, Guy Guelachvili¹, Evgeni Sorokin², Irina Sorokina², Victor Dana³, Jean-Yves Mandin³; ¹CNRS, France, ²TU Wien, Austria, ³LPMA, France.

Doppler-limited sensitive spectra are recorded between 3950 and 4050 cm^{-1} with an intracavity $\text{Cr}^{2+}:\text{ZnSe}$ laser experiment coupled to a stepping-mode time-resolved interferometer. Weak bands of CO_2 are observed for the first time in laboratory conditions.

FTuD5 • 3:30 p.m.

Time-Resolved FT-ICLAS Laboratory Spectra at 1 μm . Application to C_2H_2 and N_2

Fatou Gueye¹, Hervé Herbin¹, Robert Farrenq¹, Guy Guelachvili¹, Nathalie Picqué¹, Jean-Yves Mandin², Victor Dana²; ¹LPPM CNRS, France, ²LPMA, France.

High sensitivity spectra are obtained around 9500 cm^{-1} from a semi-conductor Vertical-Cavity-Surface-Emitting Laser (VCSEL) intracavity absorption experiment. Line intensity measurements on the ν_3 band of C_2H_2 and unstable molecules transitions detection are discussed.

FTuD6 • 3:30 p.m.

Concentration-Modulation FT Emission Spectroscopy of TiCl_4/He Plasma; Analysis of the $\text{C}^4\Delta-X^4\Phi$ $\Delta\nu=0$ Perturbed Transitions of TiCl

Hervé Herbin, Robert Farrenq, Guy Guelachvili, Nathalie Picqué; CNRS, France.

A TiCl_4/He plasma is observed by high resolution double-modulation FTS using concentration-modulation as a selective detection method. Analysis of the $\text{C}^4\Delta-X^4\Phi$ $\Delta\nu=0$ transitions of $48\text{Ti}35\text{Cl}$ reveals perturbations affecting the $\text{C}^4\Delta_{1/2}$ sub-state.

FTuD7 • 3:30 p.m.

Doppler-Shifted Transitions of a Neutral Molecule Revealed by Velocity Modulation FTS

Hervé Herbin, Robert Farrenq, Guy Guelachvili, Nathalie Picqué; LPPM CNRS, France.

Velocity-modulation Fourier transform emission spectra from an $\text{N}_2\text{O}/\text{He}$ discharge plasma are recorded between 1 and 5.5 μm . Surprisingly, they show Doppler shifted lines of Rydberg-Rydberg rovibronic transitions of the nitric-oxide neutral molecule.

FTuD8 • 3:30 p.m.

Multi-Instrument Data Assimilation Techniques for Sea Surface Temperatures and Sea State

Eileen M. Msturi¹, William Smith², John LeMarshall³; ¹NOAA/NESDIS/ORA, USA, ²Hampton Univ., USA, ³Joint Ctr. for Satellite Data Assimilation, USA.

An analysis capability to generate sea surface temperatures using MODIS and AIRS data is being developed by Hampton Univ. in conjunction with NOAA/NESDIS/Office of Research and Applications and the Joint Center for Satellite Data Assimilation.

FTuD9 • 3:30 p.m.

Time-Resolved FT Spectroscopy of Intracavity Cr^{4+} YAG Laser Absorption at 1.5 μm

Fatou Gueye¹, Guy Guelachvili¹, Nathalie Picqué¹, Ebrahim Safari², Marc Chenevier²; ¹CNRS, France, ²LSP, France.

The implementation of an intracavity absorption experiment with a $\text{Cr}^{4+}:\text{YAG}$ laser and a stepping-mode time-resolved Fourier transform interferometer is described.

FTuD10 • 3:30 p.m.

Far Infrared Spectrum of Propynal, CH_2CHO

A. R. McKellar¹, S. Denomme¹, W. S. Neil¹, J. K. Watson¹, L. K. Chu², Y. P. Lee²; ¹Natl. Res. Council of Canada, Canada, ²Natl. Tsing Hua Univ., Taiwan Republic of China.

We report the first high resolution spectrum of the ν_7 , ν_8 , and ν_{11} fundamental bands of the semi-stable molecule propynal, as recorded in the 600 - 700 cm^{-1} region using a Bomem DA8 FT spectrometer.

FTuD11 • 3:30 p.m.

Preliminary Results from Measurements of Far Infrared Radiation (80-600 cm^{-1}) Taken during the European Aqua Thermodynamic Experiment (EAQUATE) Campaign, 13-23 September 2004

Caroline V. Cox¹, J. Murray¹, P. D. Green¹, J. E. Harries¹, J. Pickering¹, J. P. Taylor²; ¹Imperial College, UK, ²Met Office, UK.

During a recent flight campaign, measurements of far infrared radiation were taken with a Fourier transform spectrometer. The results taken in clear conditions will further understanding of the atmosphere and ability to predict climate.

FTuD12 • 3:30 p.m.

Optimization of FTS Phase Correction Parameters

Locke D. Spencer, David A. Naylor; Univ. of Lethbridge, Canada.

Phase correction is critical for extracting accurate spectral information from the Fourier transform of interferograms. We discuss common sources of phase errors and the optimization of phase correction parameters required for their rectification.

FTuD13 • 3:30 p.m.

Use of Fourier Transform Spectroscopy for the Characterization of a SONET OC192 Source

Katie Krause, Jerome Genest; Univ. Laval, Canada.

Fourier Transform Spectroscopy method is applied to the measurement of a telecom OC192 source. The impact of the spectral features of the source and the Interferometer speed profile on the derived optical spectrum is determined.

FTuD14 • 3:30 p.m.

Increased Efficiency through Undersampling in Fourier Transform Spectroscopy

David A. Naylor¹, Brad G. Gom¹, Trevor R. Fulton¹, Margaret K. Tahic¹, Gary R. Davis²; ¹Univ. of Lethbridge, Canada, ²Joint Astronomy Ctr., USA.

We present the use of undersampling with a narrow band FTS operating in the step-and-integrate mode. Spectra can be unambiguously retrieved from interferograms sampled at less than the DC band-limited Nyquist sampling interval.

FTuD15 • 3:30 p.m.

Explanation of Some Anomalies in the Regularities of the SER Spectra of Benzene and Hexafluorobenzene

Aleksey M. Polubotko; Physico-Technical Inst., Russian Federation.

The report explains violation of regularities of benzene and hexafluorobenzene SER spectra when the bands, caused by the vibrations, transformed as the moment or not by the breathing vibration are the most enhanced.

Wednesday, February 2, 2005

Plaza Ballroom A

8:30 a.m.–10:30 a.m.

FWA • Forman Session

Craig J. Sansonetti; NIST, USA, Presider

FWA1 • 8:30 a.m. Invited

A VUV-EUV High Resolution Fourier Transform Spectrometer without a Beam Splitter

Denis Joyeux¹, Daniel Phalippou¹, Jean-Claude Rodier¹, Nelson de Oliveira², Laurent Nahon², Francois Polack², Michel Vervloët³; ¹Lab Charles Fabry, Inst. d'Optique and CNRS, France, ²Synchrotron SOLEIL, France, ³Lab de Photophysique Moléculaire, CNRS and Univ. Paris 11, France.

FTS can be performed in the VUV-EUV by using wavefront division interferometers. The first tests of a dedicated instrument, for high resolution absorption FTS down to 60 nm, shows nominal performances at 200 nm.

FWA2 • 9:10 a.m. Invited

UV and VUV High Resolution Fourier Transform Spectroscopy: Laboratory Atomic and Molecular Spectroscopy for Astrophysics and Atmospheric Physics Applications

Juliet Pickering¹, Darren G. Smillie¹, Richard Blackwell-Whitehead¹, Anne P. Thorne¹, Jonathan E. Murray¹, Peter L. Smith²; ¹Imperial College, UK, ²Harvard-Smithsonian Ctr. for Astrophysics, USA. Accurate new high resolution UV and VUV atomic and molecular data for astrophysics and atmospheric physics are needed. Extension of Fourier transform spectroscopy into the VUV at Imperial College is outlined, and laboratory spectroscopy applications described.

FWA3 • 9:50 a.m.

High Resolution Fourier Transform Spectroscopy of Mn I, Mn II and Ti I

Richard J. Blackwell-Whitehead¹, Juliet C. Pickering¹, Gillian Nave², Hugh R. Jones³; ¹Imperial College London, UK, ²NIST, USA, ³Astrophysics Res. Inst., Liverpool John Moores Univ., UK.

We report on recent measurements using high resolution Fourier transform spectroscopy to study hyperfine structure and oscillator strengths in Mn I, Mn II and Ti I relevant to astrophysical analysis.

FWA4 • 10:10 a.m.

Vector Radiometric Calibration Model for the Cassini Composite Infrared Spectrometer (CIRS)

Ronald C. Carlson^{1,2}, Virgil G. Kunde^{1,3}, Donald E. Jennings¹, John C. Brasunas¹, Conor A. Nixon^{1,3}; ¹NASA Goddard Space Flight Ctr., USA, ²Science Systems and Applications Inc., USA, ³Univ. of Maryland, USA.

The radiometric calibration of the Composite Infrared Spectrometer (CIRS) on the Cassini spacecraft is described. CIRS is a dual-temperature FTS with absorbing beam splitters. It was therefore necessary to develop a vector radiometric calibration model.

Plaza Ballroom B

10:30 a.m.–11:00 a.m.

Coffee Break

Plaza Ballroom B

10:30 a.m.–4:00 p.m.

Exhibits

Plaza Ballroom A

11:00 a.m.–12:20 p.m.

FWB • Mertz Session

Henry E. Revercomb; Univ. of Wisconsin at Madison, USA, Presider

FWB1 • 11:00 a.m. Invited

Fourier Transform Emission Spectroscopy of the Atmosphere with the MIPAS Instrument on Envisat

Bruno Carli; Istituto di Fisica Applicata, Italy.

MIPAS can be exploited for the retrieval of a three dimensional field of the atmospheric composition. Furthermore, the high spectral accuracy makes it possible to observe the Doppler effect due to the atmospheric winds.

FWB2 • 11:40 a.m.

Measured Telluric Continuum-Like Opacity beyond 1 THz

Juan R. Pardo¹, Eugene Serabyn², Martina C. Wiedner³; ¹Consejo Superior de Investigaciones Científicas, Spain, ²CalTech, USA, ³Univ. Köln, Germany.

An FTS mounted on the Caltech Submillimeter Observatory allowed separation of atmospheric quasicontinuum opacity terms above 1 THz. The results are compared to existing models and used to refine them in potentially interesting atmospheric windows.

FWB3 • 12:00 p.m.

The Broadband Fourier Transform Spectrometer for the REFIR (Radiation Explorer in the Far Infrared) Space Mission

Luca Palchetti¹, Giovanni Bianchini¹, Bruno Carli¹, Francesco Castagnoli¹, Ugo Cortesi¹, Marco Pellegrini¹, Francesco Esposito², Rosa Restieri², Carmine Serio², Vincenzo Cuomo³; ¹IFAC-CNR, Italy, ²DIFA-Univ. della Basilicata, Italy, ³IMAA-CNR, Italy.

A room-temperature broadband FTS was designed for the characterization of the Earth outgoing flux in the FIR spectral range with a resolution of half wavenumber. Laboratory characterization and field measurements (ground-based and balloon) are shown.

12:20 p.m.–1:50 p.m.

Lunch Break (on your own)

Plaza Ballroom A

1:50 p.m.–3:30 p.m.

FWC • Strong Session

Jean-Pierre Maillard; Inst. d'Astrophys. de Paris, France, Presider

FWC1 • 1:50 p.m. Invited

Combining the Multiplex Advantage of FT-Spectrometers with the Sensitivity of the Cavity Ring Down Technique

Richard Engel¹, Rens Zijlmans¹, Edward Hamers², Daan Schram¹; ¹Eindhoven Univ. of Technology, Netherlands, ²AKZO-NOBEL Chemicals, Netherlands.

In this contribution we will show how the ultra-high sensitivity of the Cavity Ring Down absorption technique can be combined with the multiplex advantage of Fourier Transform spectrometers.

FWC2 • 2:30 p.m. Invited

Quality Assessment of Laboratory and Space FT Measurements

Georg Wagner, Manfred Birk; DLR Inst. for Remote Sensing Technology, Germany.

Quality assessment procedures will be discussed for both laboratory and space Fourier-transform spectroscopic measurements. A selection of quality assurance methods is given for both cases, mostly utilizing redundancy and reproducibility or dedicated characterization measurements.

FWC3 • 3:10 p.m.

Conception of a Stationary Fourier Transform Infrared Spectroradiometer for Field Measurements of Radiance and Emissivity

Sophie Théas, Nicolas Guérineau, Patricia Cymbalista; ONERA, France.

An infrared spectroradiometer is being developed to make field measurements of radiance and emissivity of terrestrial surface materials. The instrument, entirely cooled, is a stationary Fourier transform spectrometer.

Plaza Ballroom B

3:30 p.m.–4:00 p.m.

Coffee Break

Plaza Ballroom A

4:00 p.m.–5:20 p.m.

FWD • Hanel Session

Andrew R. McKellar; Natl. Res. Council of Canada, Canada, Presider

FWD1 • 4:00 p.m. Invited

Fourier Transform Spectrometer Instrument Considerations for High Spatial and Spectral Resolution Hyperspectral Imaging

Henry Buijs¹, Francois Chateaufeu², Raphael Desbien²; ¹ABB BOMEM Inc., Canada, ²ABB BOMEM Inc., USA.

Single detector FTS technology is mature. An FTS with focal plane array permits Hyperspectral Imaging. Operational tradeoffs will be presented to maximize sensitivity and minimize observation time for high spatial and spectral resolution Hyperspectral imaging.

FWD2 • 4:40 p.m.

Multiple Delay Externally Dispersed Interferometry

David J. Erskine¹, Jerry Edelstein²; ¹LLNL, USA, ²Space Sciences Lab, Univ. of Calif. at Berkeley, USA.

A grating spectrograph's resolution was boosted 6x (25,000 to 140,000) by combining it in series with a Michelson interferometer whose delay was sequentially moved in a few large steps.

FWD3 • 5:00 p.m.

Wavelength Calibration of the Cassini Composite Infrared Spectrometer (CIRS) Using Spectrum De-Stretching

Ronald C. Carlson^{1,2}, Donald E. Jennings¹, John C. Brasunas¹, Virgil G. Kunde^{1,3}; ¹NASA Goddard Space Flight Ctr., USA, ²Science Systems and Applications Inc., USA, ³Univ. of Maryland, USA.

A new wavelength calibration of the Cassini Composite Infrared Spectrometer (CIRS) based upon spectrum de-stretching is described. The calibration accurately predicts the wavenumbers of spectral features for all 21 CIRS far- and mid-IR detectors.

Thursday, February 3, 2005

Plaza Ballroom A

8:30 a.m.–10:30 a.m.

FThA • Farmer Session

P. F. Bernath; Univ. of Waterloo, Canada, Presider

FThA1 • 8:30 a.m. Invited

The Tropospheric Emission Spectrometer: On-Orbit Experiences

Michael Gunson; JPL, USA.

The Tropospheric Emission Spectrometer (TES), a passively cooled imaging FTS, was designed to obtain measurements of atmospheric trace gases in the lower atmosphere. This paper presents early results and challenges of life on-orbit as part of the EOS/Aura satellite suite of instruments.

FThA2 • 9:10 a.m. Invited

Fourier Transform Spectroscopy from Balloon for Remote Sensing of the Stratosphere and the Troposphere

Claude Camy-Peyret; LPMA/CNRS, France.

A balloon-borne Fourier transform infrared spectrometer has been used for atmospheric remote sensing studies. Performances and results are reported for the two configurations used: solar absorption in limb occultation and thermal emission in nadir viewing.

FThA3 • 9:50 a.m.

Submillimeter Spectrometer for Absorption Measurements of Low Temperature Gases

Edward H. Wishnow¹, Herbert P. Gush², Mark Halpern², Irving Ozier²; ¹LLNL/Univ. of California at Berkeley, USA, ²Univ. of British Columbia, Canada.

Results from a new differential Michelson interferometer system are presented. The instrument was designed for studies of low temperature gases over the 3 to 30 wavenumber range.

FThA4 • 10:10 a.m.

Infrared Focal Plane Array with a Built-in Stationary Fourier-Transform Spectrometer: First Experimental Results

Nicolas Guerineau¹, Sylvain Rommeluere¹, Joel Deschamps¹, Eric De Borniol², Alain Million², Jean-Paul Chamonal², Gerard Destefanis²; ¹ONERA, France, ²CEA/LETI, France.

A very compact configuration of stationary Fourier transform infrared spectrometer is explored. In contrast with a classic setup, the interferometer is directly integrated in the focal plane array during its manufacturing process.

Plaza Ballroom B

10:30 a.m.–11:00 a.m.

Coffee Break

Plaza Ballroom A

11:00 a.m.–12:20 p.m.

FThB • Cooley-Tukey Session

Mark Abrams; FastMetrix Inc., USA, Presider

FThB1 • 11:00 a.m. Invited

All Sky Extrasolar Planet Searches with Multi-Object Dispersed Fixed-Delay Interferometer in Optical and Near IR

Jian Ge; Univ. of Florida, USA.

An all sky extrasolar planet survey (ASEPS) with the Sloan 2.5m wide field telescope is being developed for monitoring 1,000,000 nearby stars over a decade to detect ~ 100,000 planets.

FThB2 • 11:40 a.m. Invited

CIRS: The Composite Infrared Spectrometer on Cassini

D. E. Jennings¹, F. M. Flasar¹, G. L. Bjoraker¹, P. N. Romani¹, A. A. Simon-Miller¹, J. C. Brasunas¹, V. G. Kunde², C. A. Nixon², R. K. Achterberg³, R. Carlson³, A. A. Mamoutkine³; ¹NASA/Goddard Space Flight Ctr., USA, ²Univ. of Maryland, USA, ³Space Science and Applications Inc., USA.

The Cassini spacecraft orbiting Saturn carries a Fourier transform spectrometer, the Composite Infrared Spectrometer, to study the atmospheres of the planet, its rings and moons in the thermal infrared.

Plaza Ballroom A

12:20 p.m.–12:30 p.m.

FTS Closing Remarks

HISE Agenda and Abstracts

Joint FTS/HISE

Monday, January 31, 2005

Plaza Ballroom A

8:00 a.m.–10:30 a.m.

JMA • Joint FTS/HISE Session

Dieter Hausamann; German Aerospace Res. Est. DLR, Germany, Presider

JMA1 • 8:00 a.m.

Opening Remarks

JMA2 • 8:15 a.m.

OSA Overview

JMA3 • 8:30 a.m. Invited

Atmospheric Chemistry Experiment (ACE): Mission Overview

Peter Bernath; Univ. of Waterloo, Canada.

ACE is a Canadian satellite mission that will provide measurements leading to an improved understanding of the chemical and dynamical processes that control the distribution of ozone in the stratosphere.

JMA4 • 9:10 a.m. Invited

EAQUATE—An International Experiment for Hyperspectral Atmospheric Sounding Validation

William L. Smith; Hampton Univ., USA.

The international experiment called EAQUATE (European AQUA Thermodynamic Experiment) was held this past September in Italy and the UK to demonstrate certain ground-based and airborne systems useful for validating hyperspectral satellite sounding observations.

JMA5 • 9:50 a.m.

Concept of a Demonstrator for GLORIA

Felix Friedl-Vallon¹, Martin Riese²; ¹Inst. für Meteorologie und Klimaforschung, Forschungszentrum Karlsruhe, Germany, ²Inst. für Chemie der Geosphäre, Forschungszentrum Jülich, Germany.

This paper presents conceptual work for the Global limb Radiance Imager of the Atmosphere (GLORIA) project. The instrument will be a combination of a large thermal IR focal plane array and a low-resolution FTS.

JMA6 • 10:10 a.m.

Ground-Based Remote Sensing of the Cloudy Atmosphere—Towards an All-Encompassing Algorithm

Ulrich Löhnert, Susanne Crewell, Annika Schomburg; Meteorological Inst., Germany.

An integrated retrieval technique for determining the thermodynamic profile of the atmosphere together with macro-/and micro-physical properties of liquid clouds is presented. The method provides an uncertainty estimate, which is confirmed using independent radiosonde measurements.

Plaza Ballroom B

10:30 a.m.–11:00 a.m.

Coffee Break

Plaza Ballroom B

10:30 a.m.–4:00 p.m.

Exhibits

HISE

Monday, January 31, 2005

Plaza Ballroom C

11:00 a.m.–12:40 p.m.

HMB • Satellite Sounding and Imaging I

Allen Huang; Cooperative Inst. for Meteorological Satellite Studies, Univ. of Wisconsin at Madison, USA, Presider

HMB1 • 11:00 a.m. Invited

Coastal Waters Imaging Capability on GOES-R Hyperspectral Environmental Suite: Characteristics and Applications

Christopher W. Brown; NOAA, USA.

The Coastal Waters capability on the GOES-R Hyperspectral Environmental Suite will fill a gap in available satellite observations by providing high temporal, spatial and spectral data. An overview of this capability will be presented.

HMB2 • 11:40 a.m. Invited

Applications of the GOES-R HES (Hyperspectral Environmental Suite) Infrared Measurements

Tim Schmit¹, James Gurka¹, W. P. Menzel¹, Jun Li²; ¹NOAA/NESDIS, USA, ²CIMSS, Univ. of Wisconsin at Madison, USA.

The increased spectral, temporal and spatial resolutions of the Hyperspectral Environmental Suite (HES) on the Geostationary Operational Environmental Satellite (GOES)-R and beyond will provide a substantial increase in the quantity and quality of the products.

HMB3 • 12:20 p.m.

Atmospheric Soundings from AIRS/AMSU in Partial Cloud Cover

Joel Susskind; NASA GSFC, USA.

Results will be shown of the accuracy and spatial distribution of temperature-moisture profiles and clear column radiances derived from AIRS/AMSU-A as a function of fractional cover.

12:20 p.m.–1:50 p.m.

Lunch Break (on your own)

Plaza Ballroom C

1:50 p.m.–3:30 p.m.

HMC • Satellite Sounding and Imaging II

William L. Smith; Hampton Univ., USA, Presider

HMC1 • 1:50 p.m. Invited

Infrared Hyperspectral Sensor/RTA Validation: The AIRS Experience

Larrabee Strow; Univ. of Maryland Baltimore County, USA.

The AIRS on board NASA's Aqua satellite platform is the first of a new generation of high-spectral resolution temperature and humidity sounders for numerical weather prediction and climate change studies. We present an analysis of a dust storm in the eastern Mediterranean in October 2002.

HMC2 • 2:30 p.m. Invited

Cloud Detection, Temperature and Water Vapor Retrieval from Hyperspectral Infrared Sounder Observations

Carmine Serio^{1,2}, Annamaria Carissimo², Giuseppe Grieco², Guido Masiello³; ¹INFM, Italy, ²Univ. degli Studi della Basilicata, Italy, ³IMAA/CNR, Italy.

New generation meteorological satellites carry infrared sensors able to sense the earth emission spectrum at very high spectral resolution. The related problems of cloud detection and inversion for geophysical parameters is addressed in this paper.

HMC3 • 3:10 p.m.

Remote Sensing of Trace Gases from Advanced Sounders

Mitchell D. Goldberg¹, C. D. Barnett¹, L. McMillin¹, E. S. Maddy¹, M. T. Chahine²; ¹NOAA, USA, ²JPL, USA.

Evaluation of the temperature and moisture profile retrievals from the Atmospheric Infrared Sounder data is performed using two years of collocated global radiosonde measurements, forecast data from the NCEP-AVN and ECMWF, and NOAA-16 operational retrievals.

Plaza Ballroom B

3:30 p.m.–4:00 p.m.

Coffee Break

Plaza Ballroom C

4:00 p.m.–5:40 p.m.

HMD • Aerosol Remote Sensing

David Turner; Pacific Northwest Natl. Lab, USA, Presider

HMD1 • 4:00 p.m. Invited

Using Remote Sensing to Deduce the Aerosol Direct and Indirect Radiative Forcing of Climate

James Coakley; Oregon State Univ., USA.

Strategies for using multispectral satellite imagery data to determine the aerosol direct and indirect radiative forcing by the combination of natural and anthropogenic aerosols are described.

HMD2 • 4:40 p.m. Invited

Measuring Aerosol Single Scattering Albedo with Combined HySPAR and HSRL

Yongxiang Hu¹, Chris Hostetler¹, J. Hair¹, David Flittner¹, Steve Jones², F. Iannarilli³, Ping Yang³; ¹NASA Langley Res. Ctr., USA, ²Aerodyn Corp., USA, ³Texas A&M Univ., USA.

This study proposed an innovative method for measuring vertically integrated aerosol single scattering albedo with combined multi-angle hyperspectral polarimeter (HySPAR) and high spectral resolution lidar (HSRL) measurements for aerosols over dark ocean.

HMD3 • 5:20 p.m.

Raman Lidar Measurements of Aerosol Profiles over the Southern Great Plains during the May 2003 Aerosol IOP

Richard A. Ferrare¹, David Turner², Marian Clayton³, Dave Covert⁴, Robert Elleman⁴, Haflidi Jonsson⁵, Beat Schmid⁶, Jens Redemann⁶, John Ogren⁷, Elisabeth Andrews⁷; ¹NASA Langley Res. Ctr., USA, ²Pacific Northwest Natl. Lab, USA, ³SAIC, USA, ⁴Univ. of Washington, USA, ⁵CIRPAS/Naval Postgraduate School, USA, ⁶BAER/NASA Ames Res. Ctr., USA, ⁷NOAA/CMDL, USA.

Raman lidar measurements acquired during the May 2003 Aerosol Intensive Operations Period (IOP) are used in conjunction with airborne remote and in situ aerosol measurements to estimate aerosol refractive index and single scatter albedo.

Tuesday, February 1, 2005

Plaza Ballroom C

8:30 a.m.–10:30 a.m.

HTuA • Cloud Remote Sensing I

Richard A. Ferrare; NASA Langley Res. Ctr., USA, Presider

HTuA1 • 8:30 a.m. Invited

Study of Cloud Microphysics and Thermodynamics Using MODIS Atmospheric Products

Prof. Harshvardhan, Robert N. Green; Purdue Univ., USA.

MODIS cloud products and ancillary meteorological analyses are used to study the microphysical and thermodynamic properties of water clouds over the eastern North Pacific. A novel method of obtaining cloud droplet concentration is presented.

HTuA2 • 9:10 a.m. Invited

Spatial and Temporal Distribution of Tropospheric Clouds Observed by MODIS on-board the Terra and Aqua Satellites

Michael King, Steven Platnick; NASA/Goddard Space Flight Ctr., USA.

We will describe various cloud properties being derived from MODIS onboard the Terra and Aqua satellites. These include the latitudinal distribution of cloud optical and microphysical properties of both liquid water and ice clouds.

HTuA3 • 9:50 a.m.

Analysis of Cloud Microphysical Property from AIRS Ultraspectral Measurements

Allen Huang¹, Kevin Baggett¹, Li Guan¹, Ping Yang², Jun Li¹; ¹Cooperative Inst. for Meteorological Satellite Studies, Univ. of Wisconsin at Madison, USA, ²Dept. of Atmospheric Sciences, Texas A&M Univ., USA.

Ultraspectral infrared measurements are used with AIRS cloud cleared retrievals and ECMWF analyses to derive effective cloud height and emissivity spectra. These variables are then used to demonstrate the inference of cloud microphysical properties.

HTuA4 • 10:10 a.m.

A Simple Radiative Transfer Model for Complex Cloudy Layers or Systems, with Validation in the Oxygen A-Band

Anthony B. Davis¹, Alexander Marshak², Howard W. Barker³, Qilong Min⁴, Lee C. Harrison⁴; ¹Los Alamos Natl. Lab, USA, ²NASA Goddard Space Flight Ctr., USA, ³Meteorological Service of Canada, Canada, ⁴State Univ. of New York at Albany, USA.

Systematic effects of spatial variability on photon propagation in/between clouds are assessed. After averaging, power-law transmission replaces Beer's exponential law. Observational evidence is presented. Ramifications for climate modeling and cloud remote sensing are discussed.

Plaza Ballroom B

10:30 a.m.–11:00 a.m.

Coffee Break

Plaza Ballroom B

10:30 a.m.–5:30 p.m.

Exhibits

Plaza Ballroom C

11:00 a.m.–12:40 p.m.

HTuB • Satellite Sounding Applications I

Bryan A. Baum; NASA, USA, Presider

HTuB1 • 11:00 a.m. Invited

A Methodology for Assessing Pixel-Level Uncertainties in Global MODIS Cloud Optical and Microphysical Retrievals

Steven Platnick; NASA, USA.

We present a methodology for evaluating the quantitative uncertainty in simultaneous retrievals of cloud optical thickness and particle size for MODIS-like algorithms, including the effect of calibration, atmospheric correction, and surface albedo error terms.

HTuB2 • 11:40 a.m.

AIRS Hyperspectral Data Improves Global Forecasts

John F. Le Marshall, Jim Jung, John Derber, Russ Treadon, Stephen Lord, Mitch Goldberg, Walter Wolf, Emily Liu, Joanna Joiner, Jack Woollen; JCSDA, USA.

Full spatial resolution AIRS hyperspectral data have been assimilated using the NCEP Global Forecast System. The result has been significant improvements in forecast skill over the Southern Hemisphere and improvement over the Northern Hemisphere.

HTuB3 • 12:00 p.m.

Using MODIS with AIRS to Improve the Accuracy of AIRS Cloud Cleared Radiances

Mitchell D. Goldberg¹, Lihang Zhou², Thomas King², Walter Wolf², Chris Barnett¹; ¹NOAA, USA, ²QSS Group Inc., USA.

The 1Km high spatial resolution MODIS imager is used to quality control cloud-cleared radiances from the 14Km high spectral infrared sounder AIRS. This is accomplished by finding MODIS clear radiances values within the AIRS footprint.

HTuB4 • 12:20 p.m.

Retrievals of Temperature, Water Vapor and Cloud Water Profiles from Satellite Microwave Sounder and Imager

F. Weng¹, Q. Liu², Y. Han¹, Mitchell D. Goldberg¹; ¹NOAA, USA, ²QSS Group Inc., USA.

The measurements from microwave imaging/sounding channels are simultaneously utilized to retrieve atmospheric temperature, water vapor and cloud water profiles. To improve accuracy, the radiative transfer model includes multiple scattering from clouds and precipitation.

12:20 p.m.–1:50 p.m.

Lunch Break (on your own)

Plaza Ballroom C

1:50 p.m.–3:30 p.m.

HTuC • Surface-Based Cloud Sensing

Steven Platnick; NASA, USA, Presider

HTuC1 • 1:50 p.m. Invited

Toward Continuous Remotely Sensed Cloud Microphysical Structure for the Calculation of Heating Rate Profiles

Mark Miller¹, Eli Mlawer²; ¹Brookhaven Natl. Lab, USA, ²Atmospheric and Environmental Res. Inc., USA.

Accurate representation of the interaction of clouds and radiation is an essential step toward improved global climate simulations. Significant progress in this area is being realized by combining remotely sensed cloud assays with radiation codes.

HTuC2 • 2:30 p.m. Invited

Cirrus Cloud Properties Retrieved from A-Train and ARM Observations

Gerald Mace, Yuying Zhang, Min Deng; Univ. of Utah, USA.

We discuss a suite of cirrus property retrieval algorithms that combine active and passive remote sensing measurements collected by the A-Train and by the ARM program at its five permanent facilities.

HTuC3 • 3:10 p.m.

The Effect of Aerosols/Clouds upon the Atmospheric Rotational Raman Scatter Spectrum as Measured by the Ozone Monitoring Instrument (OMI)

David Flittner; NASA Langley Res. Ctr., USA.

Presented are calculations of the sky radiance spectrum for an atmosphere containing molecular and Mie scatterers, and includes both elastic and inelastic scattering (via rotational Raman scattering from molecular scatterers) at OMI spectral resolution.

Plaza Ballroom B

3:30 p.m.–4:00 p.m.

Coffee Break

Plaza Ballroom B

3:30 p.m.–5:30 p.m.

HTuD • HISE Poster Session

HTuD1 • 3:30 p.m.

Some Peculiarities of the SEHR Spectra of Symmetrical Molecules in the Dipole-Quadrupole SEHRS Theory

Aleksey M. Polubotko; Physico-Technical Inst., Russian Federation.

It is pointed out on the possible appearance of the strong bands, caused by the totally symmetric vibrations and some other forbidden lines in molecules with high symmetry in the dipole-quadrupole SEHRS theory
Plaza Ballroom B

HTuD2 • 3:30 p.m.

Development of a Freely Distributed, Customizable Atmospheric Radiative Transfer Model

Ian M. Chapman¹, David A. Naylor²; ¹Iunctus Geomatics Corp., Canada, ²Univ. of Lethbridge, Canada.

We present the Univ. of Lethbridge Transmission and Radiance Atmospheric Model (ULTRAM). A comparison with FASCODE is presented, along with several sample applications of ULTRAM. The source code is freely available and easily customized.

HTuD3 • 3:30 p.m.

Technological Developments in Harmful Algal Bloom Detection Using Aircraft Ocean Color Remote Sensing

Tiffany A. Moisan¹, C. W. Wright¹, Robert N. Swift², J. Yungel², M. A. Linkswiler², P. A. Tester³, S. M. Varnum³, J. M. Bane⁴, S. M. Haines⁴; ¹NASA Wallops Flight Facility, USA, ²EG&G Technical Services Inc., USA, ³NOAA Lab, USA, ⁴Dept. of Marine Science, Univ. of North Carolina at Chapel Hill, USA.

We describe details of an airborne UV sensitive spectrometer to acquire hyperspectral information with promise toward improved phytoplankton taxonomic information and potential detection of harmful algal blooms. Results from initial tests are described.

HTuD4 • 3:30 p.m.

Water Vapor Profiling Using Limb Scatter Measurements

David Flittner; NASA Langley Res. Ctr., USA.

Analysis of the use of near IR limb scatter measurements to estimate water vapor profiles in the lower stratosphere and upper troposphere. Data taken by SAGE III and other sensors will be presented.

HTuD5 • 3:30 p.m.

Representation of Limb Profiler Measurements from the Ozone Mapping and Profiler Suite (OMPS)

Philippe Q. Xu¹, Lawrence E. Flynn²; ¹I.M. Systems Group Inc., USA, ²NOAA/NESDIS, USA.

The OMPS Limb Profiler will make measurements of the scattered UV and visible light from the atmosphere. The presentation covers research on representation of the spectral and spatial complexities of the 2-D CCD detector measurements.

HTuD6 • 3:30 p.m.

Off-Beam Cloud Lidar Systems, Comparison with ARM Instruments at the Oklahoma CART Site

Igor N. Polonsky¹, Anthony B. Davis¹, Steven P. Love¹, Robert F. Cahalan², Tamas Varnai², Matthew McGill²; ¹Los Alamos Natl. Lab, USA, ²NASA - Goddard Space Flight Ctr., USA.

The ability of off-beam lidars to probe optically thick clouds is demonstrated. Results from a validation campaign at ARM's Southern Great Plains site are discussed and compared with cloud data obtained from ARM instruments.

HTuD7 • 3:30 p.m.

The Information Content of Super Channels for the AIRS Instrument

Larry M. McMillin; NOAA/NESDIS, USA.

Several ways to reduce the computation burden for hyper spectral instruments have been proposed. The retrained information content is evaluated and compared. It is shown that super channels retain almost of the information content.

HTuD8 • 3:30 p.m.

Geophysical and Cloud Parameters Retrieval from Nadir-Viewing IR Radiance

Daniel K. Zhou¹, William L. Smith², Allen M. Larar¹, Stephen A. Mango³; ¹NASA Langley Res. Ctr., USA, ²Hampton Univ., USA, ³NPOESS Integrated Program Office, USA.

Preliminary NAST-I retrievals from the recent Atlantic-THORPEX Regional Campaign (ATReC) and the European AQUA Thermodynamic Experiment (EAQUATE) are presented, and compared with coincident observations obtained from dropsondes and the nadir-pointing Cloud Physics Lidar (CPL).

HTuD9 • 3:30 p.m.

The Application of Principal Component Analysis (PCA) to AIRS Data Compression

Lihang Zhou¹, Mitchell D. Goldberg², Walter W. Wolf¹, Chris Barne²; ¹QSS Group Inc., USA, ²NOAA, USA.

PCA is a powerful tool for AIRS data compression. Eigenvector from a dependent dataset works best for data compression; those from independent datasets can be used to diagnose climate abnormal signals or high-noise in observations.

HTuD10 • 3:30 p.m.

Investigating the Separability of Temperature and CO₂ from Operational Hyperspectral Sounders

Eric S. Maddy¹, Christopher D. Barne², Larry McMillin², Mitch Goldberg²; ¹QSS Group Inc., USA, ²NOAA NESDIS/OR, USA.

Carbon Dioxide (CO₂) represents an important component of global climate change. In this study, we investigate the feasibility of CO₂ retrievals from AIRS, and detail the separability issue of temperature and CO₂ in the InfraRed.

HTuD11 • 3:30 p.m.

AIRS and IASI Local Angle Correction

Sisong Zhou¹, Lihang Zhou¹, Walter Wolf¹, Larry McMillin², Chris Barne², Mitchell D. Goldberg²; ¹QSS Group Inc., USA, ²NOAA, USA.

Algorithms and procedures have been developed to perform radiance local angle correction for both AIRS and IASI data processing system. A principal component analysis (PCA) regression approach is used to generate local angle correction coefficients.

Wednesday, February 2, 2005

Plaza Ballroom C

8:30 a.m.–10:30 a.m.

HWA • Cloud Remote Sensing II

Mark Miller; Brookhaven Natl. Lab, USA, Presider

HWA1 • 8:30 a.m. Invited

The Use of Active Remote Sensing of Constrain Cloud Models

Helene Chepfer; LMD/IPSL, France.

No abstract provided.

HWA2 • 9:10 a.m.

Monitoring of Cloud at Local Scale

Esmail Malek; Dept. of Plants, Soil and Biometrology, Utah State Univ., USA.

Kipp and Zonen pyranometers and pyrgeometers provide continuous measurements of the radiation components. During cloudy skies, emission (from 8-13 μm) from clouds is used for monitoring of cloud base height and sky coverage.

HWA3 • 9:30 a.m.

Tropospheric Dynamics and Chemistry as Revealed by AIRS Ultraspectral Remote Sensing during INTEX-A

William W. McMillan¹, Juying Warner¹, M. McCourt¹, L. Strow¹, L. Sparling¹, R. Hoff¹, K. McCann¹, R. Rogers¹, A. Chu¹, C. Barnett², W. Wolf², G. Sachse³, G. Diskin³, B. Pierce³; ¹Univ. of Maryland, Baltimore County, USA, ²NOAA/NESDIS, USA, ³NASA/LaRC, USA.

We present retrievals of tropospheric carbon monoxide from NASA's Atmospheric InfraRed Sounder (AIRS) acquired during the 2004 Intercontinental Chemical Transport Experiment North America (INTEX-A) along with modeling and in situ measurements from NASA's DC-8.

HWA4 • 9:50 a.m.

Color Infrared Survey for Identification of Failing Onsite Treatment Systems

Alfonso F. Blanco; George Mason Univ., USA.

Images that are obtained with Color Infrared Photography can provide local officials, engineers and scientists with a tool to identify septic tank failures. Failed systems can be also identified with Hyperspectral Imaging Systems.

HWA5 • 10:10 a.m.

Airborne Hyperspectral Remote Sensing of Hazardous Clouds in Real Time

Winthrop Wadsworth, Peter Dybwad; Designs & Prototypes Ltd., USA.

A high scan rate, passive FTIR hyper-spectral mosaic imaging system has been developed and demonstrated in both ground and airborne applications. The Turbo FTTM, is a rotary-scan laser-less, rugged, proven FTIR spectrometer design.

Plaza Ballroom B

10:30 a.m.–11:00 a.m.

Coffee Break

Plaza Ballroom B

10:30 a.m.–4:00 p.m.

Exhibits

Plaza Ballroom C

11:00 a.m.–12:20 p.m.

HWB • Satellite Sounding Applications II

Ping Yang; Texas A & M Univ., USA, Presider

HWB1 • 11:00 a.m.

Bias Adjustments for the AQUA AMSU Instrument

Larry M. McMillin; NOAA/NESDIS, USA.

Biases in the differences between measured and calculated radiances cause biases in retrievals. Radiance biases are shown for the AMSU flown on the Aqua satellite and the improved results after bias adjustments are made.

HWB2 • 11:20 a.m.

Intercomparison of AIRS Temperature and Water Vapor Retrievals with Matched Radiosonde Measurements and Forecasts

Murty G. Divakarla¹, Mitchell D. Goldberg², Chris Barnett², Larry McMillin², W. Wolf²; ¹STG Inc., USA, ²NOAA, USA, ³QSS Group Inc., USA.

Evaluation of the temperature and moisture profile retrievals from the Atmospheric Infrared Sounder data is performed using two years of collocated global radiosonde measurements, forecast data from the NCEP-AVN and ECMWF, and NOAA-16 operational retrievals.

HWB3 • 11:40 a.m.

NPOESS Cross-Track Infrared and Microwave Sounder Suite (CrIMSS) EDR Retrieval Algorithm and Its Performance Assessment

Degui Gu¹, Phil Moffa¹, Hilary E. Snell², Richard Lynch²; ¹Northrop Grumman Space Technology, USA, ²Atmospheric Environmental Res. Inc., USA.

This paper presents a brief description and the current performance estimate of the Environmental Data Records (EDR) retrieval algorithm for the Cross-track Infrared and Microwave Sounder Suite (CrIMSS) to fly on the NPP/NPOESS satellites.

HWB4 • 12:00 p.m.

Cirrus Measurements during the EAQUATE Campaign

Clare Lee, Anthony J. Baran, Martin D. Glew, Stuart M. Newman, Steven Abel, Jonathan P. Taylor; Met Office, UK.

Ice clouds have a significant impact on the Earth's water and radiation budgets. Here we present remote sensing and in-situ measurements of frontal cirrus, using the FAAM aircraft during the EAQUATE intercomparison campaign with AQUA.

HWB5 • 12:20 a.m.

Observations of Mineral Dust with AIRS

Larrabee Strow; Univ. of Maryland, Baltimore County, USA.

We present here an in-depth analysis of a dust storm in the eastern Mediterranean in October 2002. We will also present global observations of dust, over ocean, using AIRS to illustrate how dust contamination may affect a significant fraction of operational sounder observations.

12:20 p.m.–1:50 p.m.

Lunch Break (on your own)

Plaza Ballroom C

1:50 p.m.–3:30 p.m.

HWC • Cloud Remote Sensing III

Allen M. Larar; NASA Langley Res. Ctr., USA, Presider

HWC1 • 1:50 p.m. Invited

Estimating Cloud Properties from Passive Near-Infrared Spectral Observations

John Daniel; NOAA Aeronomy Lab, USA.

Passive spectral observations of near-infrared solar radiances in the presence of clouds can provide knowledge of several cloud physical properties. I will discuss some of these retrievable parameters using examples from both observations and calculations.

HWC2 • 2:30 p.m. Invited

Retrieving Cloud Microphysical Properties Using High Spectral Resolution Observations in the 8-13 and 3-5 Micron Windows

David Turner; Pacific Northwest Natl. Lab, USA.

Improved retrievals of microphysical cloud properties can be obtained from ground-based infrared interferometer data by simultaneously solving the radiative transfer equation in both the 8-13 and 3-5 micrometer windows.

HWC3 • 3:10 p.m.

High Resolution Far-IR Radiative Spectra from the TAFTS Instrument during EAQUATE 2004

Paul D. Green¹, J. E. Murray¹, C. Cox¹, J. E. Harries¹, J. Pickering¹, J. P. Taylor²; ¹Imperial College London, UK, ²Met Office, UK.

The EAQUATE campaign was a validation exercise for the AIRS satellite instrument, and involved two aircraft, the NASA Proteus and FAAM Bae-146. Early results of this campaign from the far-IR TAFTS instrument are presented.

Plaza Ballroom B
3:30 p.m.–4:00 p.m.
Coffee Break

Plaza Ballroom C
4:00 p.m.–5:40 p.m.
HWD • IR Remote Sensing
Qiling Min; CESTM State Univ. of New York, USA, Presider

HWD1 • 4:00 p.m.
Scanning High-Resolution Interferometer Sounder (S-HIS) Observations during ADRIEX/EAQUATE

Robert Knuteson, Fred Best, Steve Dutcher, Ray Garcia, Ben Howell, Dan LaPorte, Henry Revercomb, Joe Taylor, Dave Tobin, Paolo Antonelli; Univ. of Wisconsin at Madison, USA.

The Univ. of Wisconsin-Madison Scanning High-resolution Interferometer Sounder (S-HIS) made high altitude observations coincident with the NASA Aqua satellite during two validation campaigns ADRIEX and EAQUATE in Italy and the UK during September 2004.

HWD2 • 4:20 p.m.
Retrievals of Cloud Optical Properties from a Two-Channel Narrow-Field-of-View Radiometer
Jui-Yuan C. Chiu¹, Alexander Marshak², Keith D. Evans¹, Warren J. Wiscombe²; ¹JCET/Univ. of Maryland, Baltimore County, USA, ²NASA/Goddard Space Flight Ctr., USA.

We have pioneered a surface-based passive method for retrieving cloud optical depth in a fully three-dimensional cloud situation. This method uses zenith radiance at two channels, and requires some vegetative cover in the surrounding area.

HWD3 • 4:40 p.m.
Hyperspectral Surface Emissivity Assessment in the 3 - 13 μm Domain
Keyvan Kanani¹, Laurent Poutier¹, Marc-Philippe Stoll², Françoise Nerry²; ¹ONERA - DOTA, France, ²ULP - LSIT, France.

This paper deals with the measurement of infrared surface emissivity in spectral band 3-13 μm , using the Spectral Smoothness and Multi-Temperatures Method algorithms. Measurements simulations and preliminary results of a field campaign are presented.

HWD4 • 5:00 p.m.
Analysis of Infrared Spectral Radiance Observed during EAQUATE and Other Recent NAST Field Campaigns
Allen M. Larar¹, W. Smith², H. Revercomb³, Jon Taylor⁴, D. Zhou¹, R. Knuteson³, S. Mango⁵; ¹NASA Langley Res. Ctr., USA, ²Hampton Univ., USA, ³Univ. of Wisconsin at Madison, USA, ⁴Met Office, UK, ⁵NPOESS Integrated Program Office, USA.

Inter-comparisons of infrared spectral radiances measured from independent, spatially- and temporarily-coincident airborne and spaceborne measurement systems during the European AQUA Thermodynamic Experiment (EAQUATE) and other recent NAST field campaigns will be presented.

HWD5 • 5:20 p.m.
Investigation of Hyperspectral Interferometer Infrared Cloud Top Retrievals Using High Altitude Aircraft Measurements
Robert E. Holz¹, Paolo Antonelli¹, Steve Ackerman¹, Fred Nagel¹, Matthew McGill²; ¹Univ. of Wisconsin at Madison, CIMSS, USA, ²NASA Goddard Space Flight Ctr., USA.

Hyperspectral cloud-top altitude retrievals methods applied to S-HIS (Scanning-High-Resolution-Interferometer-Sounder) measurements are presented. Included for comparison is an improvement to the traditional CO₂-Slicing method. The new method, CO₂-Sorting, better determines optimal channel-pairs to apply to CO₂-Slicing.

Thursday, February 3, 2005

Plaza Ballroom C

8:30 a.m.–10:30 a.m.

HThA • Ice Cloud Remote Sensing

Gerald Mace; Univ. of Utah, USA, Presider

HThA1 • 8:30 a.m. Invited

Development of Ice Cloud Microphysical and Optical Models at Visible to Far-Infrared Wavelengths

Bryan A. Baum¹, Ping Yang², Andrew J. Heymsfield³; ¹NASA Langley Res. Ctr., USA, ²Texas A&M Univ., USA, ³National Ctr. for Atmospheric Res., USA.

We develop ice cloud bulk scattering models that are based on a comprehensive set of microphysical in situ measurements of ice clouds, and a set of modeled ice particles used for light scattering calculations.

HThA2 • 9:10 a.m. Invited

Study of Ice Clouds: Scattering, Radiative Transfer and Remote Sensing

Ping Yang¹, Heli Wei¹, Jianguo Niu¹, Hung-Lung (Allen) Huang², Bryan A. Baum³, Yong X. Hu³; ¹Texas A & M Univ., USA, ²Univ. of Wisconsin at Madison, USA, ³NASA Langley Res. Ctr., USA.

We develop a database of the scattering and absorption properties of ice crystals for wavelengths from 3 to 100 μm . A fast radiative transfer model is developed for simulating IR radiances for two cloud layers.

HThA3 • 9:50 a.m. Invited

On the Radiative Properties of Cirrus Cloud

Anthony Baran; Met Office, UK.

Cirrus is predominantly composed of ice crystals which vary significantly in size and shape. Such cloud has significant impact on current and future climate. The current understanding of the radiative properties of cirrus is reviewed.

Plaza Ballroom B

10:30 a.m.–11:00 a.m.

Coffee Break

Plaza Ballroom C

11:00 a.m.–12:40 p.m.

HThB • Algorithm Development and Validation

Yong Hu; NASA, USA, Presider

HThB1 • 11:00 a.m. Invited

Cloud, Radiation and Photon Path Length Distribution

Qiling Min; CESTM, SUNY, USA.

Photon path length distributions provide insights of radiative transfer through various cloudy conditions, substantially improving our understanding of where water vapor absorbs solar radiation as both the water vapor and radiation is modulated by clouds.

HThB2 • 11:40 a.m.

How Good Is Our Understanding of Infrared Radiative Transfer? Preliminary Results from EAQUATE

Stuart M. Newman, Jonathan P. Taylor, Clare Lee; Met Office, UK.

Infrared measurements from two aircraft platforms and in-situ profile data have been collected in coincidence with overpasses of AIRS (AQUA). This data set will be used to validate radiative transfer algorithms used in retrieval schemes.

HThB3 • 12:00 p.m.

Synthetic Hyperspectral Radiances for Retrieval Algorithm Development

James E. Davies¹, J. A. Otkin¹, E. R. Olson¹, X. Wang¹, H-l Huang¹, Jianguo Niu²; ¹Space Science and Engineering Ctr., Univ. of Wisconsin at Madison, USA, ²Dept. of Atmospheric Sciences, Texas A&M Univ., USA.

Accurate synthetic radiances for realistic scenarios are crucial to the development of retrieval algorithms for use with current and next generation hyperspectral sensors. We present our methods for generating and verifying synthetic hyperspectral radiances.

HThB4 • 12:20 p.m.

AEROSE 2004 Dataset for Hyperspectral Infrared Validation

Nicholas R. Nalli¹, P. Clemente-Colón², Mitchell D. Goldberg², W. Wolf², C. Barner², P. Minnett³, M. Szczodrak³, A. Jessup⁴, R. Branch⁴, V. Morris⁵; ¹QSS Group Inc., NOAA, USA, ²NOAA, USA, ³Univ. of Miami, USA, ⁴Univ. of Washington, USA, ⁵Howard Univ., USA.

This work overviews a unique complement of radiometric and in situ Saharan dust observations acquired during the 2004 Aerosol and Ocean Science Expedition (AEROSE) and their potential application for infrared hyperspectral sensor validation.

Plaza Ballroom C

12:40 p.m.–12:50 p.m.

HISE Closing Remarks