Fourier Transform Spectroscopy Topical Meeting and Tabletop Exhibit

Collocated With

Hyperspectral Imaging and Sounding of the Environment (HISE)

February 11-15, 2007

Eldorado Hotel
Santa Fe, New Mexico

PDP Submission Deadline: January 22, 12:00 noon EST (17.00 GMT)
Hotel Reservation Deadline: January 21, 2007
Pre-Registration Deadline: January 18, 2007

FTS Program and General Chairs

Donald Jennings, *NASA Goddard Space Flight Ctr., USA,* **General Chair**
Pierre Tremblay, *Univ. Laval, Canada,* **Program Chair**

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B. J. Sohn, *Seoul Natl. Univ., Republic of Korea*
Manfred Wendisch, *Leibniz Inst. Tropospharenforschung eV, Germany*

About FTS

This meeting will welcome all researchers who use Fourier transform spectrometry in their work or who have developed competing technologies within the historic application areas of FTS. The wide scope will include innovative techniques and instrumentation, laboratory research, imaging spectroscopy, remote sensing, space from the air and in space. The meeting will focus particularly on new instruments, new applications and new techniques.

Fourier transform spectrometry has been the central method in many research areas that require high accuracy, sensitivity, and resolution and continues grow in usage. Increasingly, Fourier transform spectrometry is becoming the technique of choice in new research areas, such as meteorology and chemical microscopy, where such attributes are needed. The breadth of applicability of FTS provides a common bond between researchers in otherwise disparate fields.

Meeting Topics to Be Considered

1. Instrument Technology:
    1. Novel FTS concepts and designs
    2. FTS in the sub-millimeter, infrared, visible, and ultraviolet
    3. Time resolved Fourier transform spectroscopy
    4. Imaging Fourier transform spectroscopy
    5. New technologies for FTS
    6. Laboratory instruments
    7. Space-based instruments
    8. Astronomical instruments
2. Analysis:
    1. New methods for radiometric accuracy
    2. New methods for line shape determination
    3. New methods for improving frequency accuracy
    4. Improvements in atmospheric retrievals
    5. New approaches used for spectral calibration
    6. Simultaneous observations of particulate and gaseous absorption
3. Applications:
    1. Atomic and molecular spectroscopy
    2. Raman FT spectroscopy
    3. Medical and biological *in- situ* spectroscopy
    4. Earth remote sensing from the ground, air and space
    5. Planetary spectroscopy from the ground, air and space
    6. Astronomy: the sun, stars, the interstellar medium, and the cosmic background

Invited Speakers

FTS Invited Speakers

JMA2, The Atmospheric Chemistry Experiment (ACE): Latest Results, *Peter Bernath[1,2]; [1]Univ. of Waterloo, Canada, [2]Univ. of York, United Kingdom.*

JMA4, The Tropospheric Emission Spectrometer: 2 1/2 Years of Tropospheric Composition Measurements from Space, *David M. Rider; JPL, USA.*

FMA1, First Results from the Far-Infrared Beamline at the Canadian Light Source, *Robert R. McKellar; Natl. Res. Council of Canada, Canada.*

FMB1, Coherent Fourier-Transform Spectroscopy Based on Infrared Frequency Combs, *Daniel van der Weide; Univ. of Wisconsin, USA.*

FMB4, FT-IR Hyperspectral Imaging: Applications and Data Analysis, *Boiana Budevska; DuPont Crop Protection, USA.*

FMC1, IASI Onboard MetOp and its Validation with IASI-Balloon, *Claude Camy-Peyret; LPMA/CNRS, France.*

FMC4, Far-Infrared Sounding of the Troposphere: Rational and the FIRST Instrument, *Kenneth W. Jucks[1], Marty Mlynczak[2], David Johnson[2], Harri Latvakowski[3], Mike Watson[3], Gail Bingham[3], Stan Wellard[3], Wes Traub[1]; [1]Harvard-Smithsonian Ctr. for Astrophysics, USA, 2NASA Langley Res. Ctr., USA, 3Space Dynamics Lab, USA.*

FTuA1, Limb Emission Spectroscopy with the MIPAS Balloon Version: Science, Satellite Validation and Future Perspectives, *Hermann Oelhaf; Inst. für Meteorologie und Klimaforschung Forschungszentrum Karlsruhe/ Univ. Karlsruhe, Germany.*

FTuA2, First Wideband Measurement (100-1400 cm-1) of the Atmospheric Emission Spectrum with an Uncooled FT Instrument (Including the Detector Unit) Operating at Stratospheric Balloon Altitude, *Luca Palchetti; IFAC-CNR, Italy.*

FTuB1, Performance of a Field-Portable Imaging FTS, *Martin Chamberland, Vincent Farley, Alexandre Vallières, André Villemaire; Telops Inc., Canada.*

FTuC1, An Overview of the SHS Technique and Applications, *Frederick L. Roesler; Univ. of Wisconsin-Madison, USA.*

FTuC4, 10 Years of Solar FTIR Spectrometry at the Zugspitze: Atmospheric Studies and Satellite Validation, *Ralf Sussmann; IMK-IFU, Inst. für Meteorologie und Klimaforschung, Forschungszentrum Karlsruhe, Germany.*

FTuD1, Frequency Modulation FTS: A Broadband Method for Measuring Weak Absorptions and Dispersions, *Nathalie Picqué, Guy Guelachvili; LPPM/CNRS, France.*

FTuD4, Cavity Enhanced Laser Induced Fluorescence Spectroscopy of Small Gas-Phase Molecules, *Amanda J. Ross, Raphaël Vallon, Patrick Crozet; LASIM, Univ. Lyon 1 and CNRS, France.*

FWA1, FTS-2: A Submillimetre Astronomical Imaging Fourier Transform Spectrometer, *David Naylor, B. G. Gom; Univ. of Lethbridge, Canada.*

FWA2, Imaging FTS in Astronomy: SPIRE and Beyond, *Kjetil Dohlen; Lab d'Astrophysique de Marseille (LAM), France.*

FWB1, Greenhouse Gases Observation from Space with TANSO-FTS on GOSAT, *Takashi Hamazaki[1], Yutaka Kaneko[2], Akihiko Kuze[2], Hiroshi Suto[2]; [1]JAXA - GOSAT Project Team, Japan, [2]Japan Aerospace Exploration Agency, Japan.*

FWC1, Externally Dispersed Interferometry for the Mt. Palomar Doppler Planet Search, *David J. Erskine; Lawrence Livermore Natl. Lab, USA.*

FWC4, SpiOMM: A Ground-Based Wide-Field Imaging FTS, *Frédéric Grandmont[1], Anne-Pier Bernier[2], Maxime Charlebois[2], Laurent Drissen[2]; [1]ABB Bomem, Inc., Canada, [2]Univ. Laval, Canada.*

FThA1, Flight Performance and Scientific Results of the Fourier Transform Spectrometer Onboard the ASTRO-F (AKARI) Satellite, *Mitsunobu Kawada; Nagoya Univ., Japan.*

FThA2, Double Pendulum Interferometers in Planetary Missions, *Sergio Fonti; Univ. degli Studi di Lecce, Italy.*

FThB1, Far-IR Cirrus Cloud Radiative Properties from the Tropospheric Airborne Fourier Transform Spectrometer (TAFTS) Instrument, *Paul D. Green, Neil Humpage, Caroline Cox, Jon E. Murray, John E. Harries, Juliet C. Pickering; Imperial College London, United Kingdom.*

FThB4, AIRIS--The Canadian Airborne Infrared Hyperspectral Imager: Current Status and Future Developments, *Tracy Smithson; DRDC-RDDC Valcartier, Canada.*

Program Agenda

Time	Event	Location
	Sunday, February 11	
3:00 p.m.–5:00 p.m.	Registration	*North Concourse*
	Monday, February 12	
7:00 a.m.–5:00 p.m.	Registration	*North Concourse*
8:15 a.m.–8:30 a.m.	FTS/HISE Opening Remarks	*Anasazi South*
8:30 a.m.–10:30 a.m.	JMA • FTS/HISE Joint Session	*Anasazi South*
10:30 a.m.–11:00 a.m.	Coffee Break	*Anasazi North*
10:30 a.m.–4:00 p.m.	Exhibits Open	*Anasazi North*
11:00 a.m.–12:30 p.m.	FMA • Newton Session	*Anasazi South*
11:00 a.m.–12:30 p.m.	HMA • Full Spectral Hyperspectral Data and Particle Scattering Models	*Zia*
12:30 p.m.–2:00 p.m.	Lunch (on your own)	
2:00 p.m.–3:30 p.m.	FMB • Huygens Session	*Anasazi South*
2:00 p.m.–3:30 p.m.	HMB • Aerosols	*Zia*
3:30 p.m.–4:00 p.m.	Coffee Break	*Anasazi North*
4:00 p.m.–5:30 p.m.	FMC • Young-Fresnel Session	*Anasazi South*
4:00 p.m.–5:30 p.m.	HMC • Hyperspectral Data Analysis	*Zia*
	Tuesday, February 13	
7:00 a.m.–5:00 p.m.	Registration	*North Concourse*
8:15 a.m.–10:15 a.m.	FTuA • Fourier Session	*Anasazi South*
8:15 a.m.–10:15 a.m.	HTuA • A-Train Cloud Analysis	*Zia*
10:15 a.m.–11:00 a.m.	Coffee Break	*Anasazi North*
10:15 a.m.–4:00 p.m.	Exhibits Open	*Anasazi North*
11:00 a.m.–12:30 p.m.	FTuB • Michelson Session	*Anasazi South*
11:00 a.m.–12:30 p.m.	HTuB • Ice Clouds	*Zia*
12:30 p.m.–2:00 p.m.	Lunch (on your own)	
2:00 p.m.–3:30 p.m.	FTuC • Peck Session	*Anasazi South*
2:00 p.m.–3:30 p.m.	HTuC • Polar-Orbiting Platform Data and Analysis	*Zia*
3:30 p.m.–4:00 p.m.	Coffee Break	*Anasazi North*
4:00 p.m.–5:30 p.m.	FTuD • Fellgett Session	*Anasazi South*
4:00 p.m.–5:30 p.m.	HTuD • Combination of Active and Passive Sensors	*Zia*
5:30 p.m.–7:00 p.m.	FTS/HISE Reception	*Sunset Room*
	Wednesday, February 14	
7:30 a.m.–5:00 p.m.	Registration	*North Concourse*
8:15 a.m.–10:15 a.m.	FWA • Jacquinot Session	*Anasazi South*
8:15 a.m.–10:15 a.m.	HWA • Air Quality and Trace Gases	*Zia*
10:15 a.m.–11:00 a.m.	Coffee Break	*Anasazi North*
10:15 a.m.–5:00 p.m.	Exhibits Open	*Anasazi North*
11:00 a.m.–12:30 p.m.	FWB • Connes Session	*Anasazi South*
11:00 a.m.–12:30 p.m.	HWB • Hyperspectral IR Data	*Zia*
12:30 p.m.–2:00 p.m.	Lunch Break (on your own)	
2:00 p.m.–3:30 p.m.	FWC • Cooley-Tukey Session	*Anasazi South*
2:00 p.m.–3:30 p.m.	HWC • Geostationary Satellite Data	*Zia*
3:30 p.m.–5:00 p.m.	JWA • FTS/HISE Joint Poster Session	*Anasazi North*
5:00 p.m.–7:30 p.m.	Dinner Break (on your own)	
7:30 p.m.–9:00 p.m.	FWD • FTS Postdeadline Session	*Anasazi South*
7:30 p.m.–9:00 p.m.	HWD • HISE Postdeadline Session	*Zia*
	Thursday, February 15	
8:00 a.m–12:00 p.m.	Registration	*North Concourse*
8:30 a.m.–10:30 a.m.	FThA • Mertz Session	*Anasazi South*
8:30 a.m.–10:30 a.m.	HThA • Radiative Transfer	*Zia*
10:30 a.m.–11:00 a.m.	Coffee Break	*Anasazi North*
11:00 a.m.–12:30 p.m.	FThB • Brault Session	*Anasazi South*
11:00 a.m.–12:30 p.m.	HThB • Sounding Retrievals	*Zia*
12:30 p.m.–12:45 p.m.	FTS Closing Remarks	*Anasazi South*
12:30 p.m.–12:45 p.m.	HISE Closing Remarks	*Zia*

Explanation of Session Codes

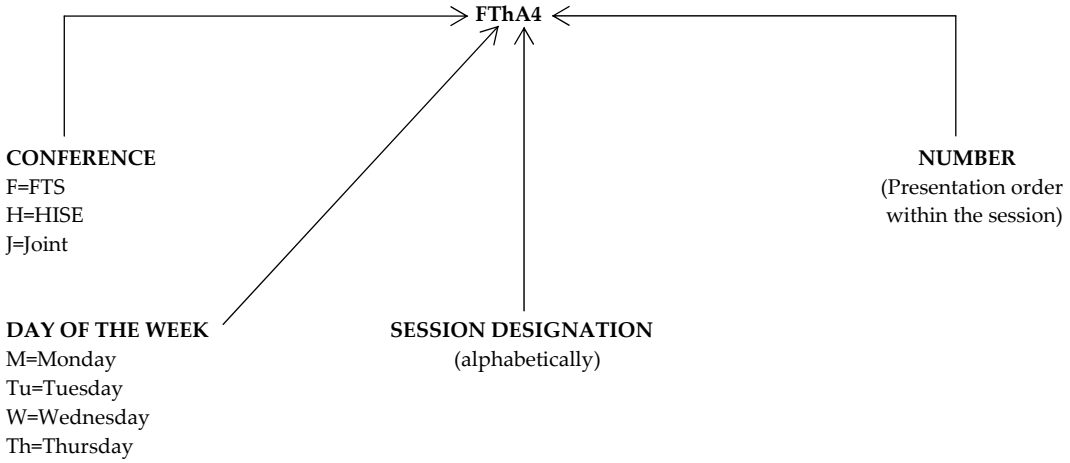
The first part of the code designates the conference (F=FTS, H=HISE, J=Joint).

The next part designates the day of the week (Monday=M, Tuesday=Tu, Wednesday=W, Thursday=Th).

The next part indicates the session within the particular day the talk is being given. Each day begins with the letter A and continues alphabetically.

The number on the end of the code signals the position of the talk within the session (first, second, third, etc.).

For example, a presentation numbered FThL4 indicates that this FTS paper is being presented on Thursday during the 1st session (A) and that it is the fourth paper presented in session FThA.



●Sunday, February 11, 2007●

North Concourse
3:00 p.m.–5:00 p.m.
Registration Open

●Monday, February 12, 2007●

North Concourse
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Anasazi South
Opening Remarks
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JMA • FTS/HISE Joint Session

Anasazi South
8:30 a.m.–10:30 a.m.
JMA • FTS/HISE Joint Session
Bryan A. Baum; Univ. of Wisconsin-Madison, USA, Presider
Claude Camy-Peyret; LPMA/CNRS, France, Presider

JMA1 • 8:30 a.m. **•Invited•**

Hyperspectral Infrared Imaging and Sounding—Measurement Concept, Technology, and Processing Approach, *William L. Smith[1,2], H. Revercomb[2], F. Best[2], A. Huang[2], R. Knuteson[2], A. Larar[3], X. Liu[3], S. Mango[4], D. Zhou[3]; [1]Hampton Univ., USA, [2]Univ. of Wisconsin/SSEC-CIMSS, USA, [3]NASA Langley Res. Ctr., USA, [4]NPOESS Integrated Program Office, USA.* Infrared hyperspectral spectrometers have brought on a new era in remote sensing measurement capabilities. The measurement concepts, technology, and processing approaches are reviewed.

JMA2 • 9:00 a.m. **•Invited•**

The Atmospheric Chemistry Experiment (ACE): Latest Results, *Peter Bernath[1,2]; [1]Univ. of Waterloo, Canada, [2]Univ. of York, UK.* ACE is a Canadian-led satellite mission that is measuring the concentrations of more than thirty atmospheric constituents by solar occultation. A selected overview of ACE results to date will be presented.

JMA3 • 9:30 a.m. **•Invited•**

Overview of GOES-R Risk Reduction and Algorithm Working Group Activities, *Mitchell D. Goldberg; NOAA, USA.* Abstract not available.

JMA4 • 10:00 a.m. **•Invited•**

The Tropospheric Emission Spectrometer: 2 1/2 Years of Tropospheric Composition Measurements from Space, *David M. Rider; JPL, USA.* The Tropospheric Emission Spectrometer (TES), launched on the AURA spacecraft in July 2004, covers the 3.2-15.4 micron spectral range with imaging arrays. TES generates global profiles of infrared-active constituents from the surface to the lower stratosphere.

Anasazi North
10:30 a.m.–11:00 a.m.
Coffee Break

Anasazi North
10:30 a.m.–4:00 p.m.
Exhibits Open

FMA • Newton Session

Anasazi South
11:00 a.m.–12:30 p.m.
FMA • Newton Session
Guy Guelachvili; CNRS, France, Presider

FMA1 • 11:00 a.m. **•Invited•**

First Results from the Far-Infrared Beamline at the Canadian Light Source, *Robert R. McKellar; Natl. Res. Council of Canada, Canada.* A beamline for high resolution far infrared spectroscopy is being commissioned at the CLS in Saskatoon. Significant increases in brightness are observed compared to conventional sources, but noise remains an issue for the synchrotron beam.

FMA2 • 11:30 a.m.

Mid Infrared Spectromicroscopy Beamline at the Canadian Light Source, *Tim May[1], Thomas Ellis[1], Ruben Reininger[2]; [1]Canadian Light*

HMA • Full Spectral Hyperspectral Data and Particle Scattering Models

Zia
11:00 a.m.–12:30 p.m.
HMA • Full Spectral Hyperspectral Data and Particle Scattering Models
Manfred Wendisch; Leibniz Inst Tropospharenforschung eV, Germany, Presider

HMA1 • 11:00 a.m. **•Invited•**

The Far-Infrared Spectrum: Exploring a New Frontier in the Remote Sensing of the Earth's Climate, *Martin Mlynczak, David G. Johnson, David P. Kratz; NASA Langley Res. Ctr., USA.* The far-infrared portion of Earth's emission spectrum is relatively unobserved despite its importance in regulating climate. New sensors enable exploration of the far-IR, opening a new window to half of the energy radiated by Earth.

HMA2 • 11:30 a.m. **•Invited•**

Hyperspectral Solar Spectral Measurements and Applications, *Peter Pilewskie[1], Sebastian Schmidt[1], Steven Platnick[2], Ping Yang[3],*

FMA • Newton Session (continued)

Source, Canada, [2]Scientific Answers & Solutions LLC, USA. The Canadian Light Source (CLS) is commissioning a beamline for mid infrared spectromicroscopy spanning from 2.5 to 25 micron wavelengths. The optics and features of this beamline and current status of the facility are presented.

FMA3 • 11:45 a.m.
Generation of Quantitative Vapor Samples for FTIR Spectroscopy, *Timothy J. Johnson, Robert L. Sams, Steven W. Sharpe; Pacific NW Natl. Lab, USA.* To help construct a database of 0.1 cm^{-1} resolution quantitative vapor-phase infrared spectra, PNNL had devised methods of improved reliability and accuracy for the delivery of liquid- and solid- phase compounds to the vapor phase.

FMA4 • 12:00 p.m.
Miniature Thermal Emission Spectrometer on the Mars Exploration Rovers, *Greg L. Mehall, Philip R. Christensen; Arizona State Univ., USA.* An overview of the Miniature Thermal Emission Spectrometer (Mini-TES) experiments on the Mars Exploration Rovers. The Mini-TES is a Fourier Transform Spectrometer (FTS) with a spectral range of 5-29 microns at 10 cm^{-1} spectral resolution.

FMA5 • 12:15 p.m.
Infrared Observations of Saturn and Titan from Cassini, *Donald E. Jennings[1], R. K. Achterberg[2], B. Bézard[3], G. L. Bjoraker[1], J. C. Brasunas[1], R. Carlson[2], A. Coustenis[3], F. M. Flasar[1], P. G. J. Irwin[4], V. G. Kunde[5], A. A. Mamoutkine[2], C. A. Nixon[5], G. S. Orton[6], J. C. Pearl[1], P. N. Romani[1], M. E. Segura[7], A. A. Simon-Miller[1], E. H. Wishnow[8], S. Vinatier[3]; [1]NASA Goddard Space Flight Ctr., USA, [2]Science Systems and Applications, Inc., USA, [3]Observatoire de Meudon, France, [4]Clarendon Lab, Univ. of Oxford, UK, [5]Dept. of Astronomy, Univ. of Maryland at College Park, USA, [6]JPL, USA, [7]QSS Group, Inc., USA, [8]Univ. of California at Berkeley, USA.* The Composite Infrared Spectrometer (CIRS) aboard the Cassini spacecraft has been orbiting Saturn for 2.5 years, yielding discoveries about the atmospheres and surfaces of the planet and its moons.

Lunch Break (on your own)
12:30 p.m.–2:00 p.m.

FMB • Huygens Session

Anasazi South
2:00 p.m.– 3:30 p.m.
FMB • Huygens Session
Jérôme Genest; Univ. Laval, Canada, Presider

FMB1 • 2:00 p.m. •Invited•
Coherent Fourier-Transform Spectroscopy Based on Infrared Frequency Combs, *Daniel van der Weide; Univ. of Wisconsin, USA.* We demonstrate real-time recording of chemical vapor fluctuations from 22 m away with a fast Fourier-transform infrared (FTIR) spectrometer that uses a laser-like infrared probing beam generated from two 10-fs Ti:sapphire lasers.

FMB2 • 2:30 p.m.
Continuous-Wave Fourier Transform Laser Sources, *Thilo Kraetschmer, Scott T. Sanders; Univ. of Wisconsin-Madison, USA.*

HMA • Full Spectral Hyperspectral Data and Particle Scattering Models (continued)

Manfred Wendisch[4], Jerry Harder[1], Jens Redemann[5]; [1]Univ. of Colorado, Lab for Atmospheric and Space Physics, USA, [2]NASA Goddard Space Flight Ctr., USA, [3]Texas A&M Univ., USA, [4]Inst. für Physik der Atmosphäre, Univ. Mainz, Germany, [5]BAERI, USA. Measurements of hyperspectral solar irradiance from aircraft and satellite are applied to a variety of cloud and aerosol remote sensing, and radiative energy budget applications.

HMA3 • 12:00 p.m. •Invited•
Hyperspectral Cloud and Aerosol Optical and Radiative Properties Modeling and Applications, *Ping Yang[1], Gang Hong[1], Jianguo Niu[1], Zhibo Zhang[1], Hung-Lung (Allen) Huang[2], Bryan A. Baum[2], Jun Li[2]; [1]Texas A&M Univ., USA, [2]Univ. of Wisconsin-Madison, USA.* This paper reports on the simulations of the hyperspectral radiative signatures of ice clouds and aerosols. Additionally, the numerical accuracy of a newly developed fast cloudy radiative transfer model is assessed.

Lunch Break (on your own)
12:30 p.m.–2:00 p.m.

HMB • Aerosols

Zia
2:00 p.m.– 3:30 p.m.
HMB • Aerosols
Patrick Minnis; NASA, USA, Presider

HMB1 • 2:00 p.m. •Invited•
Discrimination of Aerosol and Clouds Using Hyperspectral and Multispectral Measurements, *Steven Ackerman; Univ. of Wisconsin-Madison, USA.* This paper explores the advantages and disadvantages of using high-spectral resolution infrared observations coupled with imager data to detect cloud and aerosol and, where feasible, retrieve their microphysical properties.

HMB2 • 2:30 p.m. •Invited•
How 3D Science Can Help to Correctly Interpret Satellite Data on Aerosol-Cloud Interaction, *Alexander Marshak; NASA, USA.* In operational retrievals of cloud and aerosol properties, cloudy pixels are treated independent of their neighbors. We will quantify the 3D

FMB • Huygens Session (continued)

Continuous-wave frequency comb Fourier transform sources utilize interference of frequency combs to measure spectra. Spectra obtained with this approach are in agreement with results from traditional spectrometers. The sources contain no moving parts.

FMB3 • 2:45 p.m.
Distribution of Background Measurements Using a Double-Beam FTIR Spectrometer, *François Bouffard[1], Jean-Marc Thériault[2]; [1]Univ. Laval, Canada, [2]DRDC Valcartier, Canada.* Background measurements were acquired using a double-beam FTIR spectrometer in order to characterize their distribution. This distribution appears more favorable than the distribution of single-beam backgrounds for the passive detection of atmospheric contaminants.

FMB4 • 3:00 p.m. •Invited•
FT-IR Hyperspectral Imaging: Applications and Data Analysis, *Boiana Budevska; DuPont Crop Protection, USA.* This paper briefly introduces applications of FT-IR hyperspectral imaging to laboratory analyses and focuses on application of FT-IR/ATR imaging to crop protection products on test and plant surfaces. Results from univariate and multivariate analyses of the hyperspectral images are shown and advantages of the multivariate approach demonstrated.

Anasazi North
3:30 p.m.–4:00 p.m.
Coffee Break

FMC • Young-Fresnel Session

Anasazi South
4:00 p.m.– 5:30 p.m.
FMC • Young-Fresnel Session
Akihiko Kuze; Japan Aerospace Exploration Agency, Japan, Presider

FMC1 • 4:00 p.m. •Invited•
IASI Onboard MetOp and its Validation with IASI-Balloon, *Claude Camy-Peyret; LPMA/CNRS, France.* First results of the Infrared Atmospheric Sounding Interferometer (IASI) in orbit onboard the MetOp meteorological operational satellite since 19 October 2006 will be presented together with calibration and validation activities using IASI-balloon.

HMB • Aerosols (continued)

radiative effects on the retrievals of cloud and aerosol optical thicknesses and particle size.

HMB3 • 3:00 p.m. •Invited•
Improved Characterization of Aerosol Properties Using Combined Information from Remote Sensing, Laboratory Measurements and Global Modeling, *Oleg V. Dubovik; Lab d'Optique Atmospherique, CNRS Univ. de Lille, France.* Several efforts on improving characterization of tropospheric aerosol by combining complementary information from laboratory measurements of scattering by aerosol particles, aerosol remote sensing from satellite and ground and global modeling of aerosol transport are discussed.

Anasazi North
3:30 p.m.–4:00 p.m.
Coffee Break

HMC • Hyperspectral Data Analysis

Zia
4:00 p.m.– 5:30 p.m.
HMC • Hyperspectral Data Analysis
Daniel K. Zhou; NASA Langley Res. Ctr., USA, Presider

HMC1 • 4:00 p.m.
International MODIS/AIRS Processing Package (IMAPP): AIRS Retrieval Updates and Efforts, *Elisabeth Weisz, Hung-Lung Huang, Jun Li; Cooperative Inst. for Meteorological Satellite Studies, USA.* Updates on the previous version of the IMAPP AIRS retrieval software, which provides international researchers with single field-of-view (FOV) temperature, humidity, ozone profiles and surface parameters, will be presented. Future release will include cloudy retrievals.

HMC2 • 4:15 p.m. •Invited•
Radiative Transfer Modeling and Retrievals for Advanced Hyperspectral Sensors, *Xu Liu[1], D. K. Zhou[1], A. M. Larar[1], W. L. Smith[2], Stephen A. Mango[3]; [1]NASA Langley Res. Ctr., USA, [2]Hampton Univ., USA, [3]NPOESS Integrated Program Office, USA.* A novel radiative transfer model and a physical inversion algorithm based on principal component analysis will be presented. Instead of dealing with channel radiances, the new approach fits principal component scores of these quantities.

FMC • Young-Fresnel Session (continued)

FMC2 • 4:30 p.m.
Atmospheric Chemistry Experiment (ACE) Measurements of Tropospheric and Stratospheric Chemistry and Long-Term Trends, *Curtis Rinsland[1], Peter Bernath[2], Chris Boone[2], Ray Nassar[3]; [1]NASA Langley Res. Ctr., USA, [2]Univ. of Waterloo, Canada, [3]Harvard Univ., USA.* We highlight chemistry and trend measurement results from the Atmospheric Chemistry Experiment (ACE) which is providing precise middle troposphere to the lower thermosphere measurements with a 0.02 cm^{-1} resolution Fourier transform spectrometer covering 750-4400 cm^{-1}.

FMC3 • 4:45 p.m.
Static Infrared Fourier Transform Interferometer (SIFTI):Benefits of Phase Modulation Processing, *Elodie Cansot, Philippe Hébert, Alain Rosak, Christian Buil, Frédéric Bernard; CNES, France.* SIFTI (Static Infrared Fourier Transform Interferometer) is a high resolution spectrometer, part of the TRAQ payload. This paper presents a description of this instrument and gives a preliminary radiometric performance in presence of phase modulation.

FMC4 • 5:00 p.m. •Invited•
Far-Infrared Sounding of the Troposphere: Rational and the FIRST Instrument, *Kenneth W. Jucks[1], Marty Mlynczak[2], David Johnson[2], Harri Latvakowski[3], Mike Watson[3], Gail Bingham[3], Stan Wellard[3], Wes Traub[1]; [1]Harvard-Smithsonian Ctr. for Astrophysics, USA, [2]NASA Langley Res. Ctr., USA, [3]Space Dynamics Lab, USA.* The FIRST project shows the capabilities of an imaging FTS that covers the important long wavelength portion of the OLR. Here we describe the motivation behind the project, the prototype initial instrument, and results.

HMC • Hyperspectral Data Analysis (continued)

HMC3 • 4:45 p.m.
A Fast Moderate-Spectral-Resolution Atmospheric Transmittance Model, *Heli Wei[1], Xiuhong Chen[1], Ruizhong Rao[1], Yingjian Wang[1], Ping Yang[2]; [1]Anhui Inst. of Optics and Fine Mechanics, Chinese Acad. of Sciences, China, [2]Dept. of Atmospheric Sciences, Texas A&M Univ., USA.* A new moderate-spectral-resolution (1 cm^{-1}) atmospheric transmittance model based on the LBLRTM covering wavenumber from 1 to 25000 cm^{-1} is reported. The model can be used to accurately and efficiently compute atmospheric spectral transmittance.

HMC4 • 5:00 p.m.
Characterization of a Harmful Algal Bloom in Monterey Bay, CA Using Airborne Hyperspectral Imagery, *Curtiss O. Davis[1], Paul Bissett[2]; [1]Oregon State Univ., USA, [2]Florida Environmental Res. Inst., USA.* The Coastal Ocean Applications and Science Team (COAST) conducted its first experiment imaging a Harmful Algal Bloom (HAB) In Monterey Bay, CA. We describe the hyperspectral imagery and the detection of the HAB.

HMC5 • 5:15 p.m.
Improved AIRS/AMSU Surface and Atmospheric Soundings under Partial Cloud Cover Using an AIRS Only Cloud Clearing Approach, *Joel Susskind; NASA GSFC, USA.* The AIRS Version-5 cloud clearing and sounding methodology will be described briefly and results will be shown. These results demonstrate the importance of having sounding channels with very low noise extending to 2400 cm^{-1}.

●Tuesday, February 13, 2007●

North Concourse
7:00 a.m. – 5:00 p.m.
Registration Open

FTuA • Fourier Session

Anasazi South
8:15 a.m.– 10:15 a.m.
FTuA • Fourier Session
Felix Friedl-Vallon; Inst. fuer Metorologie und Klimaforschung, Germany, Presider

FTuA1 • 8:15 a.m. **•Invited•**
Limb Emission Spectroscopy with the MIPAS Balloon Version: Science, Satellite Validation and Future Perspectives, *Hermann Oelhaf; Inst. für Meteorologie und Klimaforschung Forschungszentrum Karlsruhe/ Univ. Karlsruhe, Germany.* The talk will review the cryogenic FTIR instrument MIPAS-B, including its capabilities and scientific data utilization for atmospheric research, spectroscopy and satellite validation. Perspectives to new generation instruments based on FTIR spectroscopy will be presented.

FTuA2 • 8:45 a.m. **•Invited•**
First Wideband Measurement (100-1400 cm^{-1}) of the Atmospheric Emission Spectrum with an Uncooled FT Instrument (Including the Detector Unit) Operating at Stratospheric Balloon Altitude, *Luca Palchetti; IFAC-CNR, Italy.* In Earth radiation budget experiments, one missing measurement is the spectrally resolved OLR below 400cm^{-1}. The first spectral measurement down to 100cm^{-1}, performed with an uncooled FTS on-board a stratospheric balloon, is here described.

FTuA3 • 9:15 a.m.
Geosynchronous Imaging FTS (GIFTS) Calibration Performance Assessment, *Fred A. Best[1], Henry E. Revercomb[1], Robert O. Knuteson[1], David C. Tobin[1], Joe K. Taylor[1], Doug P. Adler[1], William L. Smith[1], Daniel K. Zhou[2], Robert A. Reisse[2], John D. Elwell[3], Gregory W. Cantwell[3], Gail E. Bingham[3]; [1]Univ. of Wisconsin-Madison, USA, [2]NASA Langley Res. Ctr., USA, [3]Utah State Univ., Space Dynamics Lab, USA.* The Geosynchronous Imaging Fourier Transform Spectrometer (GIFTS) on-orbit radiometric calibration requirement of 1K is predicted to be met, based on the delivered performance of the engineering design unit on-board blackbody calibration subsystem.

FTuA4 • 9:30 a.m.
The Geosynchronous Imaging Fourier Transform Spectrometer (GIFTS): Engineering Development Unit (EDU) Noise Performance, *Joe K. Taylor[1], Henry E. Revercomb[1], David C. Tobin[1], Fred A. Best[1], Robert O. Knuteson[1], John D. Elwell[2], Greg W. Cantwell[2], Deron K. Scott[2], Joe Tansock[2], Gail E. Bingham[2], William L. Smith[3], Daniel K. Zhou[4], Robert A. Reisse[4]; [1]Space Science and Engineering Ctr., Univ. of Wisconsin-Madison, USA, [2]Utah State Univ., Space Dynamics Lab, USA, [3]Hampton Univ., USA, [4]NASA Langley Res. Ctr., USA.* The GIFTS EDU noise performance measured during thermal vacuum testing indicates that the required noise performance has been realized, and that goal performance has been achieved over much of both the Infrared detector bands.

HTuA • A-Train Cloud Analysis

Zia
8:15 a.m.–10:15 a.m.
HTuA • A-Train Cloud Analysis
Peter Pilewskie; NASA Ames Res. Ctr., USA, Presider

HTuA1 • 8:15 a.m. **•Invited•**
Update on the MODIS Collection 5 Processing Cloud Optical and Microphysical Algorithm and Product Validation, *Steven Platnick, Michael D. King; NASA Goddard Space Flight Ctr., USA.* Over the last year, extensive improvements and enhancements to the operational global MODIS cloud optical products have been implemented. Key elements of this new Collection 5 processing algorithm will be discussed along with examples.

HTuA2 • 8:45 a.m. **•Invited•**
Inference and Validation of Cloud Phase from MODIS, AIRS and CALIPSO Data, *Bryan A. Baum[1], Robert E. Holz[1], Hung-Lung Huang[1], Yong-Keun Lee[1], Ping Yang[2], Shaima L. Nasiri[2], Michael D. King[3], Steve Platnick[3]; [1]Univ. of Wisconsin-Madison, USA, [2]Texas A&M Univ., USA, [3]NASA Goddard Space Flight Ctr., USA.* We discuss how cloud phase is inferred from MODIS and AIRS data and compare global results with those obtained from analysis of CALIPSO depolarization measurements.

HTuA3 • 9:15 a.m. **•Invited•**
Improvement of Cloud Thermodynamic Phase Assessment Using Hyperspectral Measurements, *Shaima L. Nasiri[1], Brian H. Kahn[2], Bryan Baum[3]; [1]Texas A&M Univ., USA, [2]JPL, USA, [3]Univ. of Wisconsin-Madison, USA.* We discuss the difficulties inherent in the bispectral infrared thermodynamic phase retrieval of potentially mixed-phase clouds and how the phase retrievals of these clouds may be improved by including hyperspectral infrared measurements.

FTuA • Fourier Session (continued)

FTuA5 • 9:45 a.m.
GIFTS Radiance Validation from Ground-Based Sky-Viewing Comparisons to AERI, *Henry E. Revercomb[1], William L. Smith[1], David C. Tobin[1], Robert O. Knuteson[1], Fred Best[1], Joe K. Taylor[1], David D. Turner[1], Daniel K. Zhou[2], Robert A. Reisse[2], Gregory W. Cantwell[3], Joe Tansock[3]; [1]Univ. of Wisconsin-Madison, USA, [2]NASA Langley Res. Ctr., USA, [3]Utah State Univ., Space Dynamics Lab, USA.* Spectral radiance validation of the Geosynchronous Imaging Fourier Transform Spectrometer (GIFTS) engineering design unit has been performed using zenith sky viewing comparisons with an Atmospheric Emitted Radiance Interferometer (AERI). Good agreement is demonstrated.

FTuA6 • 10:00 a.m.
Geosynchronous Imaging Fourier Transform Spectrometer (GIFTS) Thermal Vacuum Testing: Aspects of Spectral Characterization, *David C. Tobin[1], Henry E. Revercomb[1], Joe K. Taylor[1], Fred A. Best[1], Robert O. Knuteson[1], William L. Smith[1], John Elwell[2], Gregory W. Cantwell[2], Gail Bingham[2], Joe Tansock[2], Robert A. Reisse[3], Daniel K. Zhou[3]; [1]Univ. of Wisconsin-Madison, USA, [2] Utah State Univ., Space Dynamics Lab, USA, [3]NASA Langley Res. Ctr., USA.* Thermal vacuum testing of GIFTS was performed at the Space Dynamics Laboratory and completed in September 2006. With a focus on spectral characterization of the sensor, analyses of selected thermal vacuum tests will be presented.

Anasazi North
10:15 a.m.–11:00 a.m.
Coffee Break

Anasazi North
10:15 a.m.–4:00 p.m.
Exhibits Open

FTuB • Michelson Session

Anasazi South
11:00 a.m.–12:30 p.m.
FTuB • Michelson Session
Christopher Manning; Manning Applied Technology, USA, Presider

FTuB1 • 11:00 a.m. •Invited•
Performance of a Field-Portable Imaging FTS, *Martin Chamberland, Vincent Farley, Alexandre Vallières, André Villemaire; Telops Inc., Canada.* This paper presents the performance of a commercial LWIR imaging FTS designed for field use. The imaging size is 320x256 in the 8-12 μm region with a user selectable spectral resolution reaching 0.25 cm^{-1}.

FTuB2 • 11:30 a.m.
Recent Developments in Instrumentation for Fourier-Transform Spectrometry, *Jérôme Genest, Pierre Tremblay, Simon Roy, Philippe Saucier, Maxime Cadotte, Patrick Dubois, Simon Potvin, Geneviève Taurand, Frédéric Talbot; Ctr. d'Optique, Photonique et Laser, Canada.* This presentation will discuss several recent developments that will impact the way we do Fourier-transform spectrometry. Real-time instrument line shape correction, new interferogram sampling techniques, frequency combs and super-continuum MID-IR sources will all be discussed.

HTuA • A-Train Cloud Analysis (continued)

HTuA4 • 9:45 a.m. •Invited•
Remote Sensing of Clouds and Aerosols from POLDER: Recent Development in the A-Train Framework and Perspectives for New Mission Concept, *Jérôme Riedi, Frédéric Parol, Didier Tanré, Jean-Luc Deuzé; Lab d'Optique Atmospherique, Univ. des Sciences et Technologies de Lille, France.* We present here recent development in clouds and aerosols remote sensing from the PARASOL mission and focus on the new insights provided by additional information available from synergy with other instruments of the A-Train.

Anasazi North
10:15 a.m.–11:00 a.m.
Coffee Break

Anasazi North
10:15 a.m.–4:00 p.m.
Exhibits Open

HTuB • Ice Clouds

Zia
11:00 a.m.–12:30 p.m.
HTuB • Ice Clouds
Steven Platnick; NASA, USA, Presider

HTuB1 • 11:00 a.m. •Invited•
The Retrieval of Cirrus Quantities from AIRS Observations: Some Challenges and Opportunities, *Brian Kahn; JPL, USA.* Abstract not available.

HTuB2 • 11:30 a.m. •Invited•
Ice Cloud Microphysical Properties and their Application to Satellite Remote Sensing, *David Mitchell[1], Robert P. d'Entremont[2], R. Paul Lawson[3]; [1]Desert Res. Inst., USA, [2]Atmospheric and Environmental Res., Inc., USA, [3]SPEC, Inc., USA.* A retrieval methodology has been developed for retrieving Deff and ice water path for ice clouds. Unique aspects include temperature-dependent diagnosis of ice crystal and size distribution shape and their coupling with cloud optical properties.

FTuB • Michelson Session (continued)

FTuB3 • 11:45 a.m.
A High Sensitivity Interferometer-Based Spectrometer without a Fourier Transform, *Ricardo C. Coutinho[1], David R. Selviah[2], Hugh D. Griffiths[3]; [1]Brazilian Navy Weapon Systems Directorate, Brazil, [2]Dept. of Electronic and Electrical Engineering, Univ. College London, UK, [3]Defence College of Management and Technology, Cranfield Univ., UK.* A novel interferometric technique which senses a change in spectrum without Fourier transformation is presented. It relies on measuring a feature of a short coherence interferogram, and compares favorably with FTS in complexity and sensitivity.

FTuB4 • 12:00 p.m.
A Novel Technique for the Metrology Calibration of a Fourier Transform Spectrometer, *Locke D. Spencer, David A. Naylor; Dept. of Physics, Univ. of Lethbridge, Canada.* A method is presented for using a Fourier transform spectrometer (FTS) to calibrate the metrology of a second FTS. This technique is particularly useful when the second FTS is inaccessible such as inside a cryostat.

FTuB5 • 12:15 p.m.
Detailed Characterization of Photoconductive HgCdTe Photodetectors: Gain and Noise Performances, *Pierre Tremblay[1], Erik Kretschmer[1], Vincent Farley[2], Martin Chamberland[2]; [1]Univ. Laval, Canada, [2]Telops Inc., Canada.* We report a novel approach to characterize photoconductive detectors. A measurement procedure is set up in order to deduce blackbody responsivity and photoconductive gain, while clearly separating source and background contributions to the shot noise.

12:30 p.m.–2:00 p.m.
Lunch Break (on your own)

FTuC • Peck Session

Anasazi South
2:00 p.m.–3:30 p.m.
FTuC • Peck Session
Juliet Pickering; Imperial College, UK, Presider

FTuC1 • 2:00 p.m. **•Invited•**
An Overview of the SHS Technique and Applications, *Frederick L. Roesler; Univ. of Wisconsin-Madison, USA.* The concepts of Spatial Heterodyne Spectroscopy (SHS) are described, and trade-offs to be considered in applications are reviewed. SHS instruments in use and in development for ground- and space-based applications will be highlighted.

FTuC2 • 2:30 p.m.
SHIMCAD Breadboard: Design and Characterization Overview , *David D. Babcock[1], Chris R. Englert[1], John M. Harlander[2]; [1]NRL, USA, [2]St. Cloud State Univ., USA.* We describe the design and characterization of a breadboard longwave infrared spatial heterodyne spectroscopy (SHS) interferometer. By measuring key instrument parameters, we show that machining tolerances are sufficient for LWIR interferometers without post-integration alignment options.

HTuB • Ice Clouds (continued)

HTuB3 • 12:00 p.m. **•Invited•**
Impact of Crystal Habit on Cirrus Radiative Properties, *Manfred Wendisch[1], Ping Yang[2], Peter Pilewskie[3]; [1]Leibniz Inst Tropospharenforschung eV, Germany, [2]Texas A&M Univ., USA, [3]Univ. of Colorado, USA.* The impact of crystal morphology on solar and thermal infrared radiative properties of subtropical cirrus is quantified. For this purpose airborne measurements and simulated optical properties of nonspherical ice crystal are implemented into radiative simulations.

12:30 p.m.–2:00 p.m.
Lunch Break (on your own)

HTuC • Polar-Orbiting Platform Data and Analysis

Zia
2:00 p.m.– 3:30 p.m.
HTuC • Polar-Orbiting Platform Data and Analysis
David Winker; NASA Langley Res. Ctr., USA, Presider

HTuC1 • 2:00 p.m. **•Invited•**
Cloud Microphysics from Cloud Radar and Lidar Onboard R/V Mirai and Comparison with CloudSat/CALIPSO Data, *Hajime Okamoto; Tohoku Univ., Japan.* This paper presents the results of cloud microphysical properties retrieved from 95-GHz radar and lidar onboard R/V Mirai. Particle size in mid-latitude cirrus is larger than in Tropics. Comparison with CloudSat/CALIPSO data is presented.

HTuC2 • 2:30 p.m. **•Invited•**
Overview of CERES, *Norman G. Loeb, Bruce A. Wielicki; NASA Langley Res. Ctr., USA.* This paper presents an overview of the CERES project. It demonstrates how algorithm improvements have lead to improved top-of-atmosphere (TOA) radiative flux accuracy. CERES shortwave flux anomalies are compared with those from Earthshine and ISCCP-FD.

FTuC • Peck Session (continued)

FTuC3 • 2:45 p.m.
An Imaging Heterodyne Spectrometer for Planetary Exploration, *Cilia Damiani[1], Pierre Drossart[1], Alain Sémery[1], Jean-Michel Réess[1], Jean-Pierre Maillard[2]; [1]LESIA, France, [2]IAP, France.* We present a new design for an imaging heterodyne FT spectrometer and the first test results. The use of SHS combined with cylindrical optics records an interferogram for each point of the slit height.

FTuC4 • 3:00 p.m. •Invited•
10 Years of Solar FTIR Spectrometry at the Zugspitze: Atmospheric Studies and Satellite Validation, *Ralf Sussmann; IMK-IFU, Inst. für Meteorologie und Klimaforschung, Forschungszentrum Karlsruhe, Germany.* The high-resolution solar FTIR operated since 1995 at the Zugspitze (47 °N, 11 °E, 2964 m asl.) is presented together with highlights from its utilization for long-term sounding of atmospheric trace gases and satellite validation.

Anasazi North
3:30 p.m.–4:00 p.m.
Coffee Break

FTuD • Fellgett Session

Anasazi South
4:00 p.m.– 5:30 p.m.
FTuD • Fellgett Session
Dieter Hausamann; German Aerospace Res. Est. DLR, Germany, Presider

FTuD1 • 4:00 p.m. •Invited•
Frequency Modulation FTS: A Broadband Method for Measuring Weak Absorptions and Dispersions, *Nathalie Picqué, Guy Guelachvili; LPPM/CNRS, France.* High-frequency modulation of the interferogram enables to achieve high sensitivity.

FTuD2 • 4:30 p.m.
High Resolution UV Fourier Transform Spectroscopy: SO_2 Photoabsorption Cross Sections for Planetary Atmosphere Studies, *Richard J. Blackwell-Whitehead[1], Douglas S. Blackie[1], Juliet C. Pickering[1], Anne P. Thorne[1], James Rufus[1], Glenn Stark[2], Peter L. Smith[3]; [1]Imperial College London, UK, [2]Wellesley College, USA, [3]Harvard-Smithsonian Ctr. for Astrophysics, USA.* Accurate laboratory SO_2 photoabsorbtion cross sections are essential for the meaningful interpretation of planetary atmospheres. New laboratory measurements of SO_2 spectra at low temperatures using high resolution VUV Fourier Transform spectroscopy are described.

FTuD3 • 4:45 p.m.
Line Mixing and Speed Dependence in CO_2 at 1.6 μm , *Malathy Devi[1], Chris Benner[1], Linda R. Brown[2], Charles E. Miller[2], Robert A. Toth[2]; [1]College of William and Mary, USA, [2]JPL, USA.* To enable column CO_2 measurements from space by OCO, ~0.3% precisions for intensities and air-broadening parameters are required for near-IR CO_2 bands. Preliminary FTS laboratory measurements at 6350 cm^{-1} using non-Voigt line profiles are described.

HTuC • Polar-Orbiting Platform Data and Analysis (continued)

HTuC3 • 3:00 p.m. •Invited•
Assimilation of Microwave Observations in Cloudy Conditions, *Fuzhong Weng; NOAA/NESDIS/ORA, USA.* Several experiments are conducted to prove the impacts of direct assimilation of cloudy radiances on hurricane analysis fields. Such tests include the WRF-GSI analysis and Hybrid Variational (HVAR) Scheme. Analysis results are rather promising.

Anasazi North
3:30 p.m.–4:00 p.m.
Coffee Break

HTuD • Combination of Active and Passive Sensors

Zia
4:00 p.m.–5:30 p.m.
HTuD • Combination of Active and Passive Sensors
Norman Loeb; NASA, USA, Presider

HTuD1 • 4:00 p.m. •Invited•
The CALIPSO Mission and Initial Observations of Clouds and Aerosols from CALIOP, *David Winker; NASA Langley Res. Ctr., USA.* Launched in April 2006, the CALIPSO satellite provides unique global measurements of aerosols and clouds using a two-wavelength polarization lidar. This talk will discuss mission status, instrument performance, and initial results.

HTuD2 • 4:30 p.m.
Comparing Actively Remote Sensed Lidar Cloud Properties with Passive AIRS and MODIS Retrievals, *Robert E. Holz[1], Tiziano Maestri[2], Steven A. Ackerman[1], Liam E. Gumley[1]; [1]Univ. of Wisconsin at Madison, CIMSS, USA, [2]Universita' degli Studi "Alma Mater Studiorum, Italy.* A new technique is presented that utilizes the vertically resolved lidar cloud extinction profile to estimate uncertainties in the passive retrievals of geometrically thick but tenuous cirrus.

HTuD3 • 4:45 p.m.
Aircraft Multi-Spectral Remote Sensing and In-Situ Measurements of UK Frontal Cirrus, *Clare Lee[1], Anthony J. Baran[1], Martin D. Glew[1], Hazel Jones[2], Stuart M. Newman[1], Jonathan P. Taylor[1]; [1]Met Office, UK, [2]Univ. of Manchester, UK.* Ice clouds have a significant impact on the Earth's water and radiation budgets. Here we present multi-spectral remote sensing and *in-situ* measurements of frontal cirrus, using the FAAM aircraft coincident with an A-train overpass.

FTuD • Fellgett Session (continued)

FTuD4 • 5:00 p.m. •Invited•

Cavity Enhanced Laser Induced Fluorescence Spectroscopy of Small Gas-Phase Molecules, *Amanda J. Ross, Raphaël Vallon, Patrick Crozet; LASIM, Univ. Lyon 1 and CNRS, France.* Active and passive optical cavities have been incorporated in laser induced fluorescence experiments, allowing resolved fluorescence spectra of weak systems to be recorded in the visible and near infrared on a Bomem DA3 FT spectrometer.

Sunset Room
5:30 p.m.–7:00 p.m.
FTS/HISE Conference Reception

HTuD • Combination of Active and Passive Sensors (continued)

HTuD4 • 5:00 p.m. •Invited•

Validation of Satellite-Based Retrievals Using Ground-Based Measurements, *Gerald Mace; Univ. of Utah, USA.* Abstract not available.

Sunset Room
5:30 p.m.–7:00 p.m.
FTS/HISE Conference Reception

●Wednesday, February 14, 2007●

North Concourse
7:30 a.m.–5:00 p.m.
Registration Open

FWA • Jacquinot Session

Anasazi South
8:15 a.m.–10:15 a.m.
FWA • Jacquinot Session
Bruce M. Swinyard; Rutherford Appleton Lab, UK, Presider

FWA1 • 8:15 a.m. **•Invited•**
FTS-2: A Submillimetre Astronomical Imaging Fourier Transform Spectrometer, *David Naylor, B. G. Gom; Univ. of Lethbridge, Canada.* We present the design of FTS-2, a dual-port imaging Fourier transform spectrometer for use with SCUBA-2 at the James Clerk Maxwell Telescope. The challenging mechanical and optical constraints imposed by the telescope interfaces are discussed.

FWA2 • 8:45 a.m. **•Invited•**
Imaging FTS in Astronomy: SPIRE and Beyond, *Kjetil Dohlen; Lab d'Astrophysique de Marseille (LAM), France.* I describe the SPIRE far infra-red imaging Fourier spectrometer in terms of optical concept, error budgeting, and ground alignment. The instrument is part of the Herschel Space Observatory, to be launched in 2008.

FWA3 • 9:15 a.m.
A High Resolution Broad Spectral Range Spatial Heterodyne Spectrometer for UV Laboratory Astrophysics, *John M. Harlander[1], James E. Lawler[2], Fred L. Roesler[2], Zach Labby[2]; [1]St. Cloud State Univ., USA, [2]Univ. of Wisconsin-Madison, USA.* A high resolving power (>500,000) Spatial Heterodyne Spectrometer with spectral coverage across the VUV - UV region is being built for laboratory spectroscopy including emission branching fractions, improved level energies, and hyperfine/isotopic parameters.

FWA4 • 9:30 a.m.
The USNO Dispersed Fourier Transform Spectrograph, *Arsen R. Hajian[1], Bradford B. Behr[1], Andrew T. Cenko[1], Douglas G. Currie[2]; [1]US Naval Observatory, USA, [2]Univ. of Maryland, USA.* The "dispersed FTS" at USNO combines a FTS with a grating spectrometer, multiplexing the interferometer output and thus boosting the instrument sensitivity. We present initial astronomical results and discuss the wide variety of future applications.

FWA5 • 9:45 a.m.
Signal-to-Noise Ratio Tradeoffs Associated with Coarsely Sampled Fourier Transform Spectroscopy, *Samuel T. Thurman, James R. Fienup; Inst. of Optics, Univ. of Rochester, USA.* Signal-to-noise ratio (SNR) tradeoffs associated with coarsely sampled step-and-integrate Fourier transform spectroscopy are derived. We show that there is no SNR penalty in the shot-noise limit for a fixed total detector integration time.

HWA • Air Quality and Trace Gases

Zia
8:15 a.m.– 10:15 a.m.
HWA • Air Quality and Trace Gases
Oleg V. Dubovik; NASA Goddard Space Flight Ctr., USA, Presider

HWA1 • 8:15 a.m. **•Invited•**
Monitoring Air Quality from Space, *Shobha Kondragunta; NOAA/NESDIS, USA.* Abstract not available.

HWA2 • 8:45 a.m. **•Invited•**
Global Monitoring of Tropospheric Pollution from Geostationary Orbit, *Kelly Chance; Harvard-Smithsonian Ctr for Astrophysics, USA.* Satellite measurements of major tropospheric pollutants have been robustly demonstrated and are now routinely made. Geostationary measurements are the logical next step in pollution monitoring from space. Requirements and constraints for geostationary measurements are presented.

HWA3 • 9:15 a.m. **•Invited•**
Observing Trace Gases from Spectrally Resolved Infrared Radiances, *Christopher D. Barnet[1], Mitch Goldberg[1], Eric Maddy[2], Xiaozhen Xiong[2]; [1]NOAA/NESDIS/STAR, USA, [2]QSS Group, Inc., USA.* We present measurements of mid-tropospheric atmospheric carbon derived from the Aqua Atmospheric Infrared Sounder and inter-comparisons with NOAA Earth System Research Laboratory/Global Monitoring Division in-situ measurements.

HWA4 • 9:45 a.m. **•Invited•**
Towards Operational Monitoring of the Chemical Composition of the Atmosphere Using Solar Backscatter Imaging Techniques, *Heinrich Bovensmann, Andreas Richter, M. Buchwitz, John P. Burrows; Inst. of Environmental Physics, Univ. of Bremen, Germany.* As demonstrated by GOME/ERS-2 and SCIAMACHY/ENVISAT and partly to be continued unitl 2020 by GOME-2/METOP, solar backscatter spectroscopy is well suited to probe atmospheric chemical composition relevant for Ozone, Air Quality and Greenhouse Gas monitoring.

FWA • Jacquinot Session (continued)

FWA6 • 10:00 a.m.
Enhanced Step-Mode FTIR Position Control, *Brandon Inberg, Carl Fahlstrom, Laura Dobeck, Lee H. Spangler, Steven R. Shaw; Montana State Univ., USA.* A step-scan interferometer has been modified to allow mirror locking a 1/6 He Ne wavelength intervals by generating quadrature synthetic reference signals representing a 3x multiple of the actual signal. Sample TRS data is presented.

Anasazi North
10:15 a.m.–11:00 a.m.
Coffee Break

Anasazi North
10:15 a.m.–4:00 p.m.
Exhibits Open

FWB • Connes Session

Anasazi South
11:00 a.m.–12:30 p.m.
FWB • Connes Session
Peter Bernath; Univ. of Waterloo, Canada, Presider

FWB1 • 11:00 a.m. **•Invited•**
Greenhouse Gases Observation from Space with TANSO-FTS on GOSAT, *Takashi Hamazaki[1], Yutaka Kaneko[2], Akihiko Kuze[2], Hiroshi Suto[2]; [1]JAXA - GOSAT Project Team, Japan, [2]Japan Aerospace Exploration Agency, Japan.* Thermal And Near infrared Sensor for carbon Observation Fourier-Transform Spectrometer on GOSAT monitors CO2 and CH4 globally from space. It has three narrow bands (0.76, 1.6, and 2 micron) and a wide band (5.5-14.3 micron).

FWB2 • 11:30 a.m.
Design and Qualification of the TANSO Interferometer, *François Châteauneuf[1], Marc-André Soucy[1], Gaétan Perron[1], Luc Lévesque[1], Jun Tanii[2]; [1]ABB, Canada, [2]NEC Toshiba Space Systems, Japan.* The Greenhouse gases Observing SATellite will monitor global distributions of CO_2. This paper presents the interferometer designed for the Thermal And Near infrared Sensor for carbon Observation FTS along with qualification and performance verification activities.

FWB3 • 11:45 a.m.
Noise Modeling for the TANSO-FTS Sensor aboard GOSAT, *Mitsuhiro Tomosada[1], Akihiko Kuze[2], Hiroe Tsubaki[3], Tatsuya Yokota[4]; [1]Inst. of Statistical Mathmatics, Japan, [2]Japan Aerospace Exploration Agency, Japan, [3]Tsukuba Univ., Japan, [4]Natl. Inst. for Environmental Studies, Japan.* Noise characteristics in the spectrum data obtained by a FTS sensor TANSO-FTS, which will be onboard GOSAT (Greenhouse gases Observing SATellite), were analyzed and modeled by numerical simulation.

FWB4 • 12:00 p.m.
Calibration Plan of GOSAT TANSO, *Kei Shiomi[1], Hiroshi Suto[1], Shuji Kawakami[1], Tomoko Kina[1], Mayumi Yoshida[2], Yasushi Mitomi[2], Nami Sekio[2], Fumie Kataoka[2]; [1]Japan Aerospace Exploration Agency, Japan, [2]Remote Sensing Technology Ctr. of Japan, Japan.* GOSAT will be launched in 2008 for observing greenhouse gases by space-borne FTS named TANSO-FTS. Sensor characterization test and

Anasazi North
10:15 a.m.–11:00 a.m.
Coffee Break

Anasazi North
10:15 a.m.–4:00 p.m.
Exhibits Open

HWB • Hyperspectral IR Data

Zia
11:00 a.m.– 12:30 p.m.
HWB • Hyperspectral IR Data
Steven Ackerman; Univ. of Wisconsin-Madison, USA, Presider

HWB1 • 11:00 a.m. **•Invited•**
Infrared Hyperspectral Sensor Radiance Performance Validation, *Allen M. Larar[1], D. Zhou[1], W. Smith[2,3], X. Liu[1]; [1]NASA Langley Res. Ctr., USA, [2]Hampton Univ., USA, [3]Univ. of Wisconsin-Madison, USA.* Advanced satellite sensors are tasked with improving measurements of the Earth's atmosphere. Measurement system validation is critical to achieving this goal and maximizing research and operational utility of resultant data.

HWB2 • 11:30 a.m. **•Invited•**
Retrieval Lesson Learned from NAST-I Hyperspectral Data, *Daniel K. Zhou[1], William L. Smith[2], Xu Liu[1], Allen M. Larar[1], Stephen A. Mango[3]; [1]NASA Langley Res. Ctr., USA, [2]Hampton Univ., USA, [3]NPOESS Integrated Program Office, USA.* The retrieval lesson learned is important to many current and future hyperspectral remote sensors. Validated retrieval algorithms demonstrate the advancement of hyperspectral remote sensing capabilities to be achieved with current and future satellite instruments.

HWB3 • 12:00 p.m. **•Invited•**
Hyperspectral Remote Sensing of the Ningaloo Reef: Data Collection, Processing, Validation and Applications in Monitoring One of the World's Largest, Most Diverse and Pristine Tropical Coral Reef Ecosystems, *James E. Davies, Wojciech M. Klonowski, Leon J. Majewski, Mark A. Gray, Mervyn J. Lynch; Curtin Univ. of Technology, Australia.* Underway physical and radiometric

FWB • Connes Session (continued)

preparation of post-launch calibration are implemented under Phase-C/D currently.

FWB5 • 12:15 p.m.
Limb Sounding with Imaging FTS: The Status of the GLORIA and IMIPAS Projects, *Felix Friedl-Vallon[1], Hermann Oelhaf[1], Peter Preusse[2], Martin Riese[2]; [1]Forschungszentrum Karlsruhe, Germany, [2]Forschungszentrum Juelich, Germany.* First characterisation results of the breadboard for the airborne Global limb Radiance Imager of the Atmosphere (GLORIA) instrument are presented. The further development path for this imaging Fourier transform spectrometer is outlined.

12:30 p.m.–2:00 p.m.
Lunch Break (on your own)

FWC • Cooley-Tukey Session

Anasazi South
2:00 p.m.– 3:30 p.m.
FWC • Cooley-Tukey Session
Jean-Pierre Maillard; Inst. d'Astrophysique de Paris, France, Presider

FWC1 • 2:00 p.m. **•Invited•**
Externally Dispersed Interferometry for the Mt. Palomar Doppler Planet Search, *David J. Erskine; Lawrence Livermore Natl. Lab, USA.* A fixed-delay interferometer placed in series with Cornell's planned TripleSpec near-infrared spectrograph at Mt. Palomar's 200 inch telescope will greatly improve its Doppler velocity precision and effective spectral resolution.

FWC2 • 2:30 p.m.
The FIR Imaging Fourier Transform Spectrometer Concept for the SPICA Mission, *Bruce M. Swinyard, Marc Ferlet; Rutherford Appleton Lab, UK.* We present the results of the design study for an Imaging FTS instrument working in the 30-200 micron waveband. The instrument is intended for use on the Japanese SPICA mission for astronomy.

FWC3 • 2:45 p.m.
The FROID Algorithm for Spectral Reconstruction, *Arsen R. Hajian[1], Bradford B. Behr[1], Andrew T. Cenko[1], Kevin H. Knuth[2], Douglas G. Currie[3]; [1]US Naval Observatory, USA, [2]Univ. of Albany, USA, [3]Univ. of Maryland, USA.* We present a Bayesian algorithm for spectral reconstruction (FROID: Fourier Reconstruction of Optical Interferometer Data). The FROID method incorporates a priori information allowing honest treatment of non-Poisson noise, bandlimited data, and other real-world effects.

FWC4 • 3:00 p.m. **•Invited•**
SpIOMM: A Ground-Based Wide-Field Imaging FTS, *Frédéric Grandmont[1], Anne-Pier Bernier[2], Maxime Charlebois[2], Laurent Drissen[2]; [1]ABB Bomem, Inc., Canada, [2]Univ. Laval, Canada.* SpIOMM is an Imaging FTS operating at the Mégantic telescope. It produces astronomical cubes of data in the visible using a CCD. Its 1.5 millions field elements makes it the largest IFTS used in astronomy.

HWB • Hyperspectral IR Data (continued)

data were captured within the Ningaloo Marine Park. Three underway transects were conducted coincident with HyMap overpasses. Local mode MISR data and ancillary aerosol and meteorological observations complete the validation set.

12:30 p.m.–2:00 p.m.
Lunch Break (on your own)

HWC • Geostationary Satellite Data

Zia
2:00 p.m.–3:30 p.m.
HWC • Geostationary Satellite Data
Martin Mlynczak; NASA Langley Res. Ctr., USA, Presider

HWC1 • 2:00 p.m. **•Invited•**
Overview of Chinese Second Generation Polar Orbiting Satellite FY-3 Imaging and Sounding Capabilities and Applications, *Chaohua Dong, Jun Yang, Naimeng Lu, Yujie Liu, Zhongdong Yang, Bin Cai; Natl. Satellite Meteorological Ctr. (NSMC) of China Meteorological Administration (CMA), China.* FY-3, the new series of Chinese polar-orbiting meteorological satellites is planed for 2007 launch. Eleven instruments covering violet, visible, near-infrared, infrared, and microwave observations to study weather, climate and other environmental features will be discussed.

HWC2 • 2:30 p.m. **•Invited•**
Development of a Multispectral and Hyperspectral Proxy Data System for GOES-R, *Hung Lung A. Huang; Univ. of Wisconsin-Madison, USA.* This paper describes an ongoing effort to develop the state-of-the-art proxy data sets, models, software tools, and their associated documents in support of broad area of GOES-R Algorithm Working Group (AWG) application and development activities.

HWC3 • 3:00 p.m. **•Invited•**
Retrieval of Cloud Properties from GOES-R, *Patrick Minnis; NASA Langley Res. Ctr., USA.* The next generation of USA geostationary satellites will have an enhanced imager, the Advanced Baseline Imager, that will enable improved detection and retrieval of cloud properties. Use of new channel combinations for retrievals is discussed.

JWA • FTS/HISE Joint Poster Session

Anasazi North
3:30 p.m.– 5:00 p.m.
JWA • FTS/HISE Joint Poster Session

JWA1
A Near-UV Spatial Heterodyne Spectrometer for Interstellar [OII] Emission Line Studies, *Edwin J. Mierkiewicz[1], Fred L. Roesler[1], John M. Harlander[2], Ronald J. Reynolds[1], Kurt P. Jaehnig[1]; [1]Univ. of Wisconsin-Madison, USA, [2]St. Cloud State Univ., USA.* Using a newly developed spatial heterodyne spectrometer, we have obtained the first radial velocity resolved observations of interstellar 3727 A emission and confirmed the superb performance of the technique for observing spatially extended faint sources.

JWA2
UV and VUV High Resolution Fourier Transform Spectroscopy: Laboratory Atomic Spectroscopy for Astrophysics Applications, *Juliet C. Pickering[1], Richard Blackwell-Whitehead[1], Darren Smillie[1], Anne P. Thorne[1], Peter L. Smith[2], Gillian Nave[3]; [1]Imperial College, UK, [2]Harvard-Smithsonian Ctr. for Astrophysics, USA, [3]NIST, USA.* High resolution spectrographs on astronomical telescopes create demands for accurate high resolution UV/VUV atomic data for interpretation of astrophysical spectra. Atomic spectroscopy combining high resolution VUV Fourier Transform and grating spectroscopy is described.

JWA3
FTIR Analysis of Pristine and Ion Irradiated Polymers, *Jitendra K. Quamara, Anu Sharma, Geetika Goyal, Randhir Singh, P. Raj, Maneesha Garg; Physics Dept., Natl. Inst. of Technology-Kurukshetra, India.* FTIR Spectroscopy has been applied for the analysis of swift heavy ion irradiated polyimides and PLCs. The FTIR spectra reveal the demerization of carbonyl groups, enhancement in the absorbed water and formation of new radicals.

JWA4
Reference Wavelengths of Thorium and Argon for the Calibration of Infrared Astronomical Spectrographs, *Gillian Nave[1], Craig J. Sansonetti[1], Florian Kerber[2]; [1]NIST, USA, [2]European Southern Observatory, Germany.* We report new reference wavelengths emitted by a Th/Ar hollow cathode lamp in the range 900 nm to 4500 nm.

JWA5
Kilometric Path Lengths in Infrared Absorption with Time-Resolved Fourier Transform Spectroscopy, *Nathalie Picqué, Véronique Girard, Mathieu Jacquemet, Robert Farrenq, Guy Guelachvili; LPPM / CNRS, France.* Time-resolved Fourier transform spectroscopy associated to intracavity laser absorption allows to record highly sensitive high resolution spectra, in the infrared up to 2.5 μm, of both stable and unstable molecules.

JWA6
NIR All-Fiber Supercontinuum Frequency Comb Spectrometer, *Philippe Saucier, Frédéric Talbot, Jérôme Genest, Pierre Tremblay; Univ. Laval, Canada.* We discuss the realisation of an all-fiber spectrometer working on the principle of heterodyne measurement using two high brightness frequency combs exhibiting supercontinua in the NIR (1.2 μm - 1.9 μm).

JWA7
New Spectral Calibration Approach Suitable for Imaging Fourier Transform Spectrometers, *Simon A. Roy[1], Simon Potvin[1], Jérôme Genest[1], Raphaël Desbiens[2]; [1]Univ. Laval, Canada, [2]ABB Bomem Inc., Canada.* A new approach to line shape correction is presented. The method uses line shape integration to calibrate the spectral grids of pixels and is thus convenient for spectrometers equipped a CCD camera.

JWA8
New Sampling Approach Suitable for Imaging Fourier Transform Spectrometers with Integrating Detector, *Simon A. Roy[1], Jérôme Genest[1], Martin Chamberland[2]; [1]Univ. Laval, Canada, [2]Telops Inc., Canada.* A new approach to interferogram sampling is presented. The method reduces data load and processing overhead while allowing post-correction of sampling errors. It is particularly well suited for continuous-scan spectrometers equipped with a CCD camera.

JWA9
FPGA SoC Architecture for Imaging FTS Real-Time Data Processing, *Patrick Dubois[1,2], Martin Chamberland[2], Jerome Genest[1], Sebastien Roy[1]; [1]Univ. Laval, Canada, [2]Telops Inc., Canada.* A FPGA SoC architecture is presented which can perform real-time data processing of imaging FTS data. Datacubes co-adding, FFTs, spectral cropping and radiometric calibration can be performed at a datarate in excess of 30 Mpixels/s.

JWA10
An OSSE for Aerosol, *Renske Timmermans[1], Martijn Schaap[1], Stephen Tjemkes[2], Peter Builtjes[1]; [1]TNO, Netherlands, [2]EUMETSAT, Germany.* The study aims to quantify the impact of satellite derived aerosol information as observed by future instruments on the forecasting and analysis of PM2.5 levels over Europe using an observing system simulation experiment.

JWA11
Plume Identification and Tracking Using Satellite Imaging, *Moncef B. Tayahi[1], Ilham Sadri[1], Michael Meinhold[2]; [1]Advanced Photonics Res. Lab, Univ. of Nevada, USA, [2]SAIC, USA.* The aim of this work is to combine visible, near infrared, and thermal optical infrared channels in order to produce a two-dimensional spectral map in which plumes can be identified and tracked in real time.

JWA12
Aerosol and Surface Properties Characterization from Joint Inversion of Ground-Based and Satellite Observations, *Alexander Sinyuk[1], Oleg Dubovik[2], Brent Holben[3], Tom F. Eck[4], Francois-Marie Breon[5], John Martonchik[6], Ralph Kahn[6], David J. Diner[6], Eric F. Vermote[7], Jean-Claude Roger[8], Tatyana Lapyonok[1], Ilya Slutsker[1]; [1]Science Systems and Applications, Inc., USA, [2]Lab d'Optique Atmospherique, CNRS Universite de Lille, France, [3]Lab for Terrestrial Physics, NASA Goddard Space Flight Ctr., USA, [4]GEST Ctr., Univ. of Maryland Baltimore County, USA, [5]Lab des Sciences du Climat et de l'Environnement, France, [6]JPL, Caltech, USA, [7]Univ. of Maryland at College Park, USA, [8]OPGC/LAMP Univ. Blaise Pascale, France.* A method for simultaneously retrieving aerosol and surface parameters from ground based and satellite observations collocated in space and time is presented. The improvements in aerosol and surface reflectance characterization are discussed.

JWA • FTS/HISE Joint Poster Session (continued)

JWA13
Capabilities of the MTG-IRS Candidate Candidate Mission to Depict Horizontal Moisture Structures, *Stephen Tjemkes, Jochen Grandell, Regis Borde, Rolf Stuhlmann; EUMETSAT, Germany.* The MTG-IRS candidate mission has primary objective to monitor atmospheric dynamics using water vapour tracers. Using different analysis, capabilities of MTG to meet mission objectives will be shown

JWA14
Level 0 to 1 Algorithm Theoretical Basis for the On-Orbit Calibration of the Geostationary Imaging Fourier Transform Spectrometer, *Robert Knuteson, Henry E. Revercomb, David C. Tobin; Univ. of Wisconsin-Madison, USA.* The UW-Madison Space Science and Engineering Center has applied its extensive experience to the development of Level 0 to 1 ground data processing algorithms for the on-orbit calibration of the Geostationary Imaging FTS (GIFTS) sensor.

JWA15
Mulitlayer Cloud Detection in the MODIS Collection 5 Cloud Product, *Steven Platnick[1], Michael King[1], Gala Wind[1,2], G. Thomas Arnold[1,2], M. McGill[1], Steven Ackerman[3], Robert Holz[3], Bryan Baum[3], Ping Yang[4]; [1]NASA Goddard Space Flight Ctr., USA, [2]SSAI, USA, [3]Univ. of Wisconsin-Madison, USA, [4]Texas A&M Univ., USA.* Multilayer cloud detection using, in part, a water vapor absorption band at 0.94 μm has been implemented in the recent MODIS Collection 5 processing stream. Evaluation with active sensor(s) will be discussed.

JWA16
SIRAS-G, the Spaceborne Infrared Atmospheric Sounder for Geosynchronous Earth Orbit, *Thomas Kampe; Ball Aerospace and Technologies Corp., USA.* SIRAS-G, developed under NASA's 2002 IIP is enabling technology for future spaceborne IR sounders. A major aspect of this program was a laboratory demonstration dispersive spectrometer. Results from the demo instrument development program are described.

JWA17
GIFTS EDU Ground-Based Measurement Experiment, *D. K. Zhou[1], W. L. Smith[2], L. J. Zollinger[3], R. J. Huppi[4], R. A. Reisse[1], A. M. Larar[1], X. Liu[1], J. J. Tansock[3], S. M. Jensen[3], H. E. Revercomb[2], W. F. Feltz[2], G. E. Bingham[3]; [1]NASA Langley Res. Ctr., USA, [2]Univ. of Wisconsin, USA, [3]Space Dynamics Lab, Utah State Univ., USA,[4]ZelTech, USA.* GIFTS EDU is an imaging infrared spectrometer designed for atmospheric soundings. The EDU ground-based measurement experiment was held in Logan, Utah during September 2006 to demonstrate its extensive capabilities for geosynchronous and other applications.

JWA18
Diurnal and Seasonal Contrasts in Cloud Properties from AIRS Data, *Yong-Keun Lee[1], Ping Yang[2], Hung-Lung Huang[1], Bryan A. Baum[1]; [1]Space Science and Engineering Ctr., USA, [2]Dept. of Atmospheric Sciences, Texas A&M Univ., USA.* We discuss diurnal and seasonal contrasts of cloud properties over a tropical region based on analysis of Atmospheric Infrared Sounder (AIRS) data.

JWA19
Hyperspectral Remote Sensing of the Coastal Environment, *David D. R. Kohler, W. Paul Bissett, Robert G. Steward, Mubin Kadiwala, Robert Banfield; FERI, USA.* Paper details the construction of a new hyperspectral sensor focused on the coastal environment. This sensor follows the same basic design strategy as its predecessor, the NRL developed PHILLS sensor.

JWA20
An Automated Nonrigid Registration for a Tunable Hyperspectral Imaging System, *Hector Erives[1], Scott Teare[1], Glenn J. Fitzgerald[2]; [1]New Mexico Tech, USA, [2]Dept. of Primary Industries, Horsham, Australia.* A method that uses the Phase Correlation and a geometric transformation is proposed to estimate nonrigid registration errors for a hyperspectral imaging system. It computes multiple correlations to find and correct for local registration errors.

JWA21
Spectral Errors and Their Affect on Retrieval of Temperature and Water Vapor Profiles in the Presence of Clouds, *Brian R. Johnson, Grzegorz Miecznik, Thomas U. Kampe; Ball Aerospace and Technologies Corp., USA.* The impact of spectral channel registration errors in an imaging grating spectrometer on the retrieval of temperature and water vapor profiles in the presence of opaque, low-level (~700 mb) clouds is investigated.

JWA22
Effects of Jitter Motion on Atmospheric Temperature and Humidity Retrievals from FTS IR Measurements, *Grzegorz Miecznik, Brian R. Johnson; Ball Aerospace and Technologies Corp., USA.* Co-registration errors caused by a line of sight jitter across a cloud boundary introduce spectral artifacts into hyperspectral FTS radiances. Analytical derivation and examples of atmospheric temperature and moisture retrieval sensitivity to jitter is presented.

JWA23
Study of High Temporal Ozone Product from Imagers Onboard Geostationary Satellites, *Xin Jin[1], Jun Li[1], Christopher C. Schmidt[1], Timothy J. Schmit[2], Jinlong Li[1]; [1]Cooperative Inst. for Meteorological Satellite Studies (CIMSS), USA, [2]Advanced Satellite Product Branch, Ctr. for Satellite Applications and Res., NESDIS/NOAA, USA.* The capability of total column ozone (TCO) measurements was demonstrated by the SEVIRI data as a proxy for ABI. The retrieved TCO has good agreement (R=0.92, RMSE=4%) with that from OMI onboard the EOS/Aura platform

JWA24
The Hyperspectral Infrared Sounding Simulation Study Using WRF Data, *Chian-Yi Liu[1], Jun Li[1], Timothy J. Schmit[2], Elisabeth Weisz[1], Erik Olson[1], Jason Otkin[1]; [1]CIMSS, USA, [2]NOAA/NESDIS/Ctr. for Satellite Applications and Res., USA.* The geostationary hyperspectral infrared sounder studied for the next generation GOES. An atmospheric sounding retrieval algorithm has been developed for processing the GHS under clear and cloudy skies through eigenvector regression with all IR channels.

5:00 p.m.–7:30 p.m.
Dinner Break (on your own)

FWD • FTS Postdeadline Session

Anasazi South
7:30 p.m.–9:00 p.m.
FWD • FTS Postdeadline Session
Donald E. Jennings; NASA Goddard Space Flight Ctr., USA, Presider

HWD • HISE Postdeadline Session

Zia
7:30 p.m.–9:00 p.m.
HWD • HISE Postdeadline Session
Jerome Riedi; Lab d'Optique Atmospherique, Univ. des Sciences et Technologies de Lille, France, Presider

●Thursday, February 15, 2007●

8:00 a.m.–12:00p.m.
Registration Open

FThA • Mertz Session

Anasazi South
8:30 a.m.– 10:30 a.m.
FThA • Mertz Session
David Naylor; Univ. of Lethbridge, Canada, Presider

FThA1 • 8:30 a.m. •Invited•
Flight Performance and Scientific Results of the Fourier Transform Spectrometer Onboard the ASTRO-F (AKARI) Satellite, *Mitsunobu Kawada; Nagoya Univ., Japan.* We developed the imaging Fourier transform spectrometer (iFTS) of the infrared astronomical satellite AKARI, which was launched on February 21, 2006. The iFTS works very well and takes many far-infrared spectra of the sky.

FThA2 • 9:00 a.m. •Invited•
Double Pendulum Interferometers in Planetary Missions, *Sergio Fonti; Univ. degli Studi di Lecce, Italy.* The discussion is focused on the advantages of using double pendulum interferometers in planetary missions, but also on the problems connected with their characteristics. Examples of existing and future instruments of this kind are given.

FThA3 • 9:30 a.m.
Basic Principle of Doppler Asymmetric Spatial Heterodyne Spectroscopy (DASH): An Innovative Concept for Measuring Winds in Planetary Atmospheres, *Christoph R. Englert[1], Michael H. Stevens[1], David E. Siskind[1], David D. Babcock[1], John M. Harlander[2]; [1]NRL, USA, [2]St. Cloud State Univ., USA.* We introduce an innovative concept for inferring altitude profiles of horizontal atmospheric wind by measuring the Doppler shift of multiple emission lines versus altitude. Instruments using this approach will be well suited for planetary missions.

FThA4 • 9:45 a.m.
Wide-field Imaging FTSs at High Spectral Resolution for Astronomy, *Jean-Pierre Maillard; Inst. d'Astrophysique de Paris, France.* An imaging FTS as a direct imager can combine a wide-field coverage with a high spectral resolution. This unique property is exploited in several instrumental projects which are presented.

HThA • Radiative Transfer

Zia
8:30 a.m.– 10:30 a.m.
HThA • Radiative Transfer
Allen M. Larar; NASA Langley Res. Ctr., USA, Presider

HThA1 • 8:30 a.m. •Invited•
Infrared Radiative Transfer in Cloudy Atmospheres and Retrieval Applications, *Jean-Luc Moncet[1], Robert d'Entremont[1], David Mitchell[2], Gennady Uymin[1], Ryan Aschbrenner[1], Alan Lipton[1]; [1]Atmospheric and Environmental Res., Inc., USA, [2]Desert Res. Inst., USA.* The Optimum Spectral Sampling method for fast and accurate radiative transfer has been enhanced for speed in clear atmospheres and extended to cloudy atmospheres. Applications to retrieval of cloud properties from infrared measurements are described.

HThA2 • 9:00 a.m.
A New Model for Domain-Average Solar Radiative Transfer in the Cloudy Atmosphere with Validation from Recent Ground-Based O_2 A-band Spectroscopy, *Anthony B. Davis[1], Klaus Pfeilsticker[2]; [1]Los Alamos Natl. Lab, USA, [2]Heidelberg Univ., Inst. für Umweltphysik, Germany.* We present a new forward radiation transport model targeting large-scale shortwave fluxes and radiances in the presence of arbitrary cloudiness. Excellent agreement with recent pathlength observations is achieved with just one spatial variability parameter.

HThA3 • 9:15 a.m.
Improvements to the Tafkaa Atmospheric Correction Algorithm for Hyperspectral Ocean-Color Data, *Marcos J. Montes, Bo-Cai Gao; NRL, USA.* The Tafkaa atmospheric correction algorithm, used primarily for atmospheric correction of ocean color data, has been improved to include the ability to use the full view-geometry and solar geometry for each pixel of data.

HThA4 • 9:30 a.m.
Forward Modelling of Aircraft and Satellite Radiances from the EAQUATE Campaign, *Stuart M. Newman; Met Office, UK.* The European AQUA Thermodynamic Experiment (EAQUATE) produced a comprehensive set of radiometric and in-situ profiles. These data are valuable for investigations into atmospheric radiative transfer and validation of temperature and humidity retrievals from hyperspectral sounders.

HThA5 • 9:45 a.m.
Modeling Aerosol Radiance for NCEP Data Assimilation, *Quanhua Liu[1], Yong Han[2],[1], Paul van Delst[1], Fuzhong Weng[2]; [1]JCSDA, USA, [2]NOAA/NESDIS/ORA, USA.* CRTM can quantitatively simulate the aerosol effect on satellite radiances. Sensitivity studies show that the dust aerosol may reduce modeling brightness temperature by 1 Kelvin at 11 μm and 4 Kelvin at 3.7 μm.

FThA • Mertz Session (continued)

FThA5 • 10:00 a.m.
A New Static Fourier-Transform Spectrometer: The First Spectra from Synthesis Temporal Aperture Reconstruction Spectrometer, *Stéphane Santran, Patrice Nagtegaele, Bruno Bousquet, Laurent Sarger, Lionel Canioni; CPMOH, France.* In the framework of spatial aperture synthesis, we developed a temporal aperture synthesis allowing the concatenation of several interferograms. We succeed to enhance the resolving power of static Fourier-transform spectrometers by a factor of 40.

FThA6 • 10:15 a.m.
A Broadband Spatial Heterodyne Spectrometer for High Resolution Studies of Faint Extended Emission Sources, *Walter Harris, Olivia Dawson; Univ. of Washington, USA.* Spatial heterodyne spectrometers (SHS) provide high étendue and spectral resolution in a compact instrument well suited for observing extended emissions over a narrow bandpass. Here we describe progress toward development of a tunable broadband SHS.

Anasazi North
10:30 a.m.–11:00 a.m.
Coffee Break

FThB • Brault Session

Anasazi South
11:00 a.m.– 12:30 p.m.
FThB • Brault Session
Mark Abrams; FastMetrix, Inc., USA, Presider

FThB1 • 11:00 a.m. **•Invited•**
Far-IR Cirrus Cloud Radiative Properties from the Tropospheric Airborne Fourier Transform Spectrometer (TAFTS) Instrument, *Paul D. Green, Neil Humpage, Caroline Cox, Jon E. Murray, John E. Harries, Juliet C. Pickering; Imperial College London, UK.* We present the results from on-going work on cirrus cloud radiative emission in the far-IR from datasets collected in a number of recent campaigns involving the TAFTS instrument.

FThB2 • 11:30 a.m.
Airborne Forward-Looking Interferometer Turbulence Investigation, *William Smith[1], Stanislav Kireev[1], Gary Gimmestad[2], Leanne West[2], Xu Liu[3], Philip Schaffner[3], John J. Murray[3]; [1]Hampton Univ., USA, [2]Georgia Tech Res. Inst., USA, [3]NASA Langley Res. Ctr., USA.* The NASA Langley Research Center is conducting a feasibility study of a Forward-Looking Interferometer to detect and measure hazards to aircraft, including turbulence, low visibility, volcanic ash, icing conditions, wind shear, and wake vortices.

FThB3 • 11:45 a.m.
Design of a Fourier-Transform Spectral Imager for Airborne Measurements, *Yann Ferrec[1], Jean Taboury[1], P. Fournet[1], H. Sauer[1], F. Goudail[1], P. Chavel[1], Nicolas Guérineau[2], C. Coudrain[2], S. Thétas[2], P. Cymbalista[2], J. Primot[2], J. Deschamps[2]; [1]IOTA, France, [2]ONERA, France.* We present an experimental spectral imager based on a Michelson interferometer with dihedrons. This design allows a high geometrical étendue and a simplicity for fringes tuning.

HThA • Radiative Transfer (continued)

HThA6 • 10:00 a.m.
Retrieval of Aerosol Properties from SAGE III Limb Scattering Measurements: Future Applications for OMPS, *Robert P. Loughman[1], Didier F. Rault[2], Terry Deshler[3]; [1]Hampton Univ., USA, [2]NASA Langley Res. Ctr., USA, [3]Univ. of Wyoming, USA.* SAGE III limb scattering (LS) radiances are inverted, producing stratospheric aerosol extinction profiles. Initial agreement with coincident solar occultation measurements is 25 ± 75%, and adding aerosol size distribution retrievals should increase extinction retrieval quality.

HThA7 • 10:15 a.m.
Applications of Synthetic GOES-R Data, *Louie Grasso[1], Mark DeMaria[2], Renate Brummer[1]; [1]CIRA/CSU, USA, [2]NOAA/NESDIS/ORA/RAMMB, USA.* A method has been developed to create synthetic GOES-R data from high-resolution mesoscale model and radiative transfer calculations. This synthetic data is being used to evaluate the capabilities of GOES-R for severe weather analysis.

Anasazi North
10:30 a.m.–11:00 a.m.
Coffee Break

HThB • Sounding Retrievals

Zia
11:00 a.m.–12:30 p.m.
HThB • Sounding Retrievals
Fuzhong Weng; NOAA/NESDIS/ORA, USA, Presider

HThB1 • 11:00 a.m. **•Invited•**
Development and Demonstration of Hyperspectral Infrared Only Sounding Retrieval, *Jun Li[1], Jinlong Li[1], Elisabeth Weisz[1], Chian-Yi Liu[1], Timothy J. Schmit[2], Allen Huang[1], Mitchell D. Goldberg[2], W. Paul Menzel[1]; [1]Univ. of Wisconsin-Madison, USA, [2]Ctr. for Satellite Applications and Res., NOAA/NESDIS, USA.* Algorithm has been developed for retrieving temperature and moisture profiles from hyperspectral infrared sounder radiances under both clear and cloudy skies. Focus has been on handling surface emissivity and clouds in infrared only sounding retrieval.

HThB2 • 11:30 a.m. **•Invited•**
Capability of High Spectral Resolution Observations in the Infrared to Detect Water Vapor Structures, *Carmine Serio, Giuseppe Grieco, Guido Masiello; Univ. degli Studi della Basilicata, Italy.* The problem of physically-based inversion of high spectral resolution infrared observations for the retrieval of fine-scale vertical structures of water vapor in the lower atmosphere has been addressed in this study.

FThB • Brault Session (continued)

FThB4 • 12:00 p.m. •Invited•

AIRIS—The Canadian Airborne Infrared Hyperspectral Imager: Current Status and Future Developments, *Tracy Smithson; DRDC-RDDC Valcartier, Canada.* The AIRIS instrument, developed for the Defense Research and Development Canada, is described. Example measurements are presented and progress towards future real-time processing capabilities, discussed.

Anasazi South
12:30 p.m.– 12:45 p.m.
FTS Closing Remarks

HThB • Sounding Retrievals (contined)

HThB3 • 12:00 p.m. •Invited•

Dry Bias in Satellite-Derived Clear-Sky Water Vapor and its Consequences in Climate Change Studies, *B. J. Sohn; Seoul Natl. Univ., Republic of Korea.* Abstract not available.

Zia
12:30 p.m.– 12:45 p.m.
HISE Closing Remarks

Key to Authors and Presiders