

# ATMOS 2015



## Advances in Atmospheric Science and Applications

**8-12 June 2015**

**University of Crete | Heraklion, Greece**

**Amphitheater Maria Manassaki**

### PROGRAMME

#### Day 1, Monday 8 June 2015

09:00	09:45	<b>Registration</b>	
09:45	09:50	<b>Welcome</b>	<b>E. G. Stephanou - Rector University of Crete</b>
09:50	10:00	<b>Opening</b>	<b>C. Zerefos - Academy of Athens</b>
10:00	10:15	<b>Conference Goals</b>	<b>C. Zehner - ESA</b>
10:15	10:35	Observing the Anthropocene from Space: Past achievements and Challenges (from SCIAMACHY to GeoSCIA/Copernicus Sentinel 4, Sentinel 5, CarbonSat and SCIA-ISS	J. Burrows - University of Bremen

GHG Session		Chairs: D. Crisp, M. Buchwitz	
10:35	10:55	Carbon Dioxide and Methane Observation by GOSAT for Six Years	T. Yokota - NIES
10:55	11:15	Early Results from the NASA Orbiting Carbon Observatory-2 (OCO-2)	D. Crisp - NASA
11:15	11:45	<b>Coffee Break</b>	
11:45	12:00	The Greenhouse Gas Project of ESA's Climate Change Initiative (GHG-CCI): Phase 2 Achievements and Future Plans	M. Buchwitz - University of Bremen
12:00	12:15	Upper tropospheric methane observations from GOSAT from thermal infrared soundings	H. Sembhi - University of Leicester
12:15	12:30	CH4 Profile Retrievals from GOSAT Thermal Infrared Measurements	A. de Lange - SRON
12:30	14:00	<b>Lunch</b>	
14:00	14:15	Phosgene in the UTLS: Vertical Distribution from MIPAS Observations Using New Spectroscopic Data	M. Valeri - ISAC-CNR
14:15	14:30	Methane Retrievals in the Thermal and Short-Wave Infrared from IASI	D. Knappett - RAL
14:30	14:45	Multi-satellite Constraints on South America Wetland and Fire Carbon Fluxes	A. Bloom - California Institute of Technology
14:45	15:00	Tropical controls on the CO2 atmospheric growth rate 2010-2011 from the NASA Carbon Monitoring System Flux (CMS-Flux) Project	K. Bowman - NASA
15:00	15:15	Quantifying the impact of column integrated CO2 observations data on NEP and NPP by supplementary assimilation into CCDAS	R. Giering - FastOpt

15:15	15:30	Towards Disentangling Natural and Anthropogenic GHG Fluxes from Space - The CarbonSat Earth Explorer 8 Candidate Mission	H. Bovensmann - University of Bremen
15:30	16:00	<b>Coffee Break</b>	
16:00	16:00	<b>Future Missions Session</b>	<b>Chairs: I.Aben</b>
16:00	16:15	The Sentinel-4 Mission and its Atmospheric Composition Products	B. Veihelmann - ESA
16:15	16:30	Copernicus Sentinel-5: Long-Term Global Monitoring of Atmospheric Composition	J. Langen -ESA
16:30	16:45	Two small Limb Sounding missions to explore the forthcoming Stratosphere: ALTIUS and PICASSO	D. Fussen - BIRA/IASB
16:45	17:00	The EarthCARE mission: An Active View on Aerosols, Clouds and Radiation	P. Ingmann - ESA
17:00	17:15	ADM-Aeolus, ESA's Wind Lidar Mission and its spin-off aerosol profile products	A. Straume - ESA
17:15	18:00	DISCUSSION	
18:00	20:00	<b>Welcome Cocktail</b> - (in the Chemistry Department )	
<b>Day 2, Tuesday 9 June 2015</b>			
<b>Reactive Trace Gases Session</b>		<b>Chairs: J. Burrows, D. Fussen</b>	
09:00	09:15	Ozone structure and variability in the upper troposphere and lower stratosphere as seen by Envisat and ESA Third-party mission limb profiling instruments	V. Sofieva - FMI
09:15	09:30	New MIPAS V7 products	P. Raspollini - IFAC-CNR
09:30	09:45	MLS-based detection and attribution of the recovery of ozone in the Antarctic ozone hole	J. de Laat - KNMI

09:45	10:00	Continuation of GOMOS, MIPAS and SCIAMACHY-limb Ozone Record using OMPS Limb Profiler	N. Kramarova - SSAI
10:00	10:15	Uncertainties in recent satellite ozone profile trend assessments (SI2N, WMO 2014) : A network-based assessment of fourteen contributing limb and occultation data records	D. Hubert - BIRA/IASB
10:15	10:30	Twelve Years of the Atmospheric Chemistry Experiment (ACE) Satellite: Mission Status and Recent Results	K. Walker - University of Toronto
10:30	11:00	<b>Coffee Break</b>	
11:00	11:15	Using visible spectra to improve sensitivity to near-surface ozone of UV-retrieved profiles from MetOp GOME-2	G. Miles - RAL
11:15	11:30	Distribution and Time Evolution of the Ozone Instantaneous Longwave Radiative Effect from IASI and TES Observations	S. Doniki - Université Libre de Bruxelles
11:30	11:45	Sensitivity of Northern Hemispheric Tropospheric Ozone To Anthropogenic Emissions as Observed by Satellite Observations	J. Worden - JPL
11:45	12:00	Springtime Variability of Lower Tropospheric Ozone over Eastern Asia: Respective Role of Cyclones and Pollution as Determined from IASI	G. Dufour - LISA
12:00	12:15	Global and Regional Ozone Trends Using 20 Years of European Satellite Data	M. Coldewey-Egbers - DLR
12:15	12:30	Ozone Profile Changes and Montreal Protocol	J. Staehelin - ETHZ
12:30	14:00	<b>Lunch</b>	
<b>Reactive Trace Gases Session</b>		<b>Chairs: M. López-Puertas, D.Loyola</b>	
14:00	14:15	Evaluation of GOME, SCIAMACHY, GOME2, SBUV,	J-P. Pommerau

		OMI and IASI–METOP total ozone retrievals performances by comparison with SAOZ NDACC ground-based measurements	- LATMOS
14:15	14:30	Atmospheric Sulphur from the Upper Troposphere to the Upper stratosphere: 10 Years of MIPAS Observations	M. Hoepfner - KIT
14:30	14:45	Improved Algorithms for GOMOS/ENVISAT Water Vapor Retrieval at 936 nm and O2A band	J-L. Bertaux - LATMOS
14:45	15:00	Satellite Observations of Carbonyl Fluoride (COF2) and Hydrogen Fluoride (HF) and their Comparisons with SLIMCAT Chemical Transport Model Calculations	J. Harrison - University of Leicester
15:00	15:15	Reanalysis of the Stratospheric Chemical Composition Based on Assimilation of EOS Aura MLS and MIPAS: methane (CH4) and nitrous oxide	Q. Errera - BIRA/IASB
15:15	15:45	<b>Coffee Break</b>	
15:45	16:00	Synergy between middle infrared and mm-wave limb sounding of atmospheric temperature and minor constituents in different cloudy scenario	U. Cortesi - Institute for Applied Physics "Nello Carrara
16:00	16:15	The Middle and Upper Atmosphere as Observed by MIPAS/Envisat	M. López-Puertas - IAA
16:15	16:30	Upper Atmospheric N2O in the High Latitudes and its Descent into the Stratosphere	P. Sheese - University of Toronto
16:30	16:45	Global Atomic Oxygen and Hydrogen Abundance in the Upper Mesosphere and Lower Thermosphere as Measured by SCIAMACHY	M. Kaufmann - FZJ
16:45	17:00	Satellite measurements of NO in the mesosphere and lower thermosphere	S. Bender - KIT
17:00	17:15	The 'Limb Gap': Perspectives on Future	M. van Weele -

		Operational Ozone Profile Monitoring Needs	KNMI
17:15	17:45	DISCUSSION	
<b>Day 3, Wednesday 10 June 2015</b>			
<b>Clouds/Aerosols Session</b>		<b>Chairs: J.Tamminen, T.Holzer-Popp</b>	
09:00	09:20	Satellite-derived Aerosol Climate Data Records in the ESA Aerosol_cci Project	T. Holzer-Popp - DLR
09:20	09:35	Polar Mesospheric Cloud Particle Size Retrieval from GOMOS / ENVISAT Observations	K. Pérot - Chalmers University of Technology
09:35	09:50	AerGom, a GOMOS retrieval algorithm optimized for stratospheric aerosols: Recent developments	C. Bingen - BIRA/IASB
09:50	10:05	Aerosol detection with infrared limb measurements in the troposphere and stratosphere	S. Griessbach - FZJ
10:05	10:20	Aerosol absorption above clouds from combined OMI and MODIS hyper spectral measurements	M. de Graaf - Delft University of Technology
10:20	10:35	Aerosol and Cloud Properties Retrieval using the ATSR Dual and Single View algorithms	G. de Leeuw - FMI
10:35	11:00	<b>Coffee Break</b>	
11:00	11:15	Three-dimensional distribution of a major desert dust outbreak over East Asia in March 2008 derived from IASI satellite observations	J. Cuesta - LISA
11:15	11:30	Saharan Desert Dust Sources: New Insights Based on Aerosol Vertical Profiles Retrieved from Thermal Infrared Measurements by IASI	S. Vandebussche - BIRA/IASB
11:30	11:45	GOME-2 Cloud top height and optical depth retrieval using ROCINN V3.0	S. Gimeno García - DLR

11:45	12:00	Algorithm Development and Verification of Aerosol and Cloud Products for Sentinel-5 Precursor	L. Lelli - University Bremen
12:00	12:15	The Finokalia Ground-based Station in Crete and its potential for ESA Cal/Val Activities	V. Amiridis - National Observatory of Athens
12:15	12:45	DISCUSSION	
12:45	14:00	<b>Lunch</b>	
<b>Air Quality Session</b>		<b>Chairs: P.Levelt , T.Wagner</b>	
14:00	14:15	A global catalogue of SO2 sources and emissions derived from the Ozone Monitoring Instrument	V. Fioletov - Environment Canada
14:15	14:30	An Innovative Satellite SO2 and HCHO Retrieval Algorithm based on Principal Component Analysis: Contribution to the Sentinel-5P Mission	N. Krotkov - NASA
14:30	14:45	Sulfur dioxide retrievals from TROPOMI : algorithmic developments, verification on synthetic spectra and application to OMI measurements	N. Theys - BIRA/IASB
14:45	15:00	OMI/Aura, SCIAMACHY/Envisat and GOME2/MetopA Sulphur Dioxide Estimates; the case of Eastern Asia.	M. Koukouli - AUTH
15:00	15:15	Tropospheric Volcanism and Air-Traffic	C. Zerefos - Academy of Athens
15:15	18:15	<b>Poster Session</b>	
<b>Day 4, Thursday 11 June 2012</b>			
<b>Preparation for Sentinel S5P/Air Quality Session Chairs: P.Levelt, T.Wagner</b>			

09:00	09:30	TROPOMI on the Copernicus Sentinel 5 Precursor: instrument and on-ground calibration results	P. Veefkind and A. Ludewig - KNMI
09:30	09:45	Sentinel 5P TROPOMI Short-wave Infrared On Ground Calibration	M. Krijger - SRON
09:45	10:00	Sentinel-5 Precursor: Preparing the first Copernicus Atmospheric Mission	H. Nett - ESA
10:00	10:20	Overview of Sentinel 5 Precursor Trace Gas, UV, Cloud and Aerosol Products	D. Loyola - DLR
10:20	10:35	Sentinel-5 Precursor: Exploitation Phase of the first Copernicus Atmospheric Mission	T. Fehr - ESA
10:35	11:00	<b>Coffee Break</b>	
<b>Preparation for Sentinel S5P/Air Quality Session Chairs: M.Riese, J.Orphal</b>			
11:00	11:15	TROPOMI's CO retrieval code for the Sentinel 5 Precursor mission tested on 10 years of SCIAMACHY's 2.3 $\mu\text{m}$ measurements	T. Borsdorff - SRON
11:15	11:30	Developments in the retrieval of NO <sub>2</sub> from OMI and TROPOMI observations	H. Eskes - KNMI
11:30	11:45	Estimation of stratospheric NO <sub>2</sub> from nadir-viewing satellites: The MPI-C TROPOMI verification algorithm	S. Beirle - MPI Chemistry Mainz
11:45	12:00	Satellite-based Trends of Tropospheric NO <sub>2</sub> over Large Urban Agglomerations and an Approach Towards Their Validation	P. Schneider - NILU
12:00	12:15	Evaluation of Discrepancies in the Anthropogenic NO <sub>x</sub> Emission Trends across Europe: Synergistic use of LOTOS-EUROS and NO <sub>2</sub> Tropospheric Columns from GOME-2 and OMI.	L. Curier - TNO
12:15	12:30	The S-5P/TROPOMI formaldehyde retrieval algorithm baseline and its application to OMI and	I. De Smedt - BIRA/IASB



		GOME-2 measurements	
<b>12:30</b>	<b>14:00</b>	<b>Lunch</b>	
<b>14:00</b>	<b>14:15</b>	Shortwave infrared measurements of the TROPOMI instrument on the Sentinel 5 Precursor mission	J. Landgraf - SRON
<b>14:15</b>	<b>14:30</b>	Improving the NO <sub>2</sub> retrieval for S5P	A. Richter - University of Bremen
<b>14:30</b>	<b>14:45</b>	Spectroscopic database for TROPOMI/Sentinel 5 precursor	J. Loos - DLR
<b>14:45</b>	<b>15:00</b>	Improved HCOOH retrieval from IASI measurements: Comparison with ground-based measurements	M. Pommier - Sorbonne Universités
<b>15:00</b>	<b>15:15</b>	Revising the global budget of glyoxal (OCHCHO) based on OMI and GOM2 vertical columns	J-F. Müller - BIRA/IASB
<b>15:15</b>	<b>15:30</b>	Biomass burning emissions estimates from IASI CO satellite measurement	M. Krol - Wageningen University
<b>15:30</b>	<b>16:00</b>	<b>Coffee Break</b>	
<b>Preparation for Sentinel S5P/Air Quality Session Chairs: W.Lahoz, Heskes</b>			
<b>16:00</b>	<b>16:15</b>	On the consistency of top-down hydrocarbon emission fluxes inferred from GOME-2 and OMI formaldehyde observations	J. Stavrakou - BIRA/IASB
<b>16:15</b>	<b>16:30</b>	Assessing the potential of TROPOMI for global monitoring of terrestrial chlorophyll fluorescence	L. Guanter - GFZ Potsdam
<b>16:30</b>	<b>16:45</b>	GlobEmission: applications of emission estimates from satellite	R. van der A - KNMI
<b>16:45</b>	<b>17:00</b>	Monitoring air pollution at global scale using the IASI thermal infrared instrument	S. Bauduin - Université Libre de Bruxelles

17:00	17:15	Global Distribution of Tropospheric BrO Observed from Satellite	T. Kurosu - JPL
17:15	17:30	Seasonal variation of bromine monoxide over the Rann of Kutch salt marsh seen from space	C. Hörmann - MPI
17:30	18:00	DISCUSSION	

### Day 5, Friday 12 June 2015

#### Applications/Data Assimilation Session

Chairs: W.Lahoz, H.Eskes

09:00	09:20	Assimilating Satellite Data in the Copernicus Atmosphere Monitoring Service Global Data Assimilation System: Current Status and Prospects for the Sentinel Era	R. Engelen - ECMWF
09:20	09:35	Sodankylä satellite data centre and almost real-time monitoring of atmospheric composition in Northern Europe	J. Tamminen - FMI
09:35	09:50	Monitoring the changing environment of the 21st Century: the role of OSSEs in determining the future global observing system	W. Lahoz - NILU
09:50	10:05	Added value and optimal design of future satellite observations for air quality applications - Observing System Simulation Experiments	Lyana Curier - TNO
10:05	10:20	The atmospheric composition geostationary satellite constellation for air quality and climate science: Evaluating performance with Observation System Simulation Experiments	D. Edwards - NCAR
10:20	10:35	Fast emission estimates for rapidly changing economies constrained by satellite observations	B. Mijling - KNMI
10:35	11:10	<b>Coffee Break</b>	

#### Applications/Data Assimilation Session

Chair: M. Kanakidou

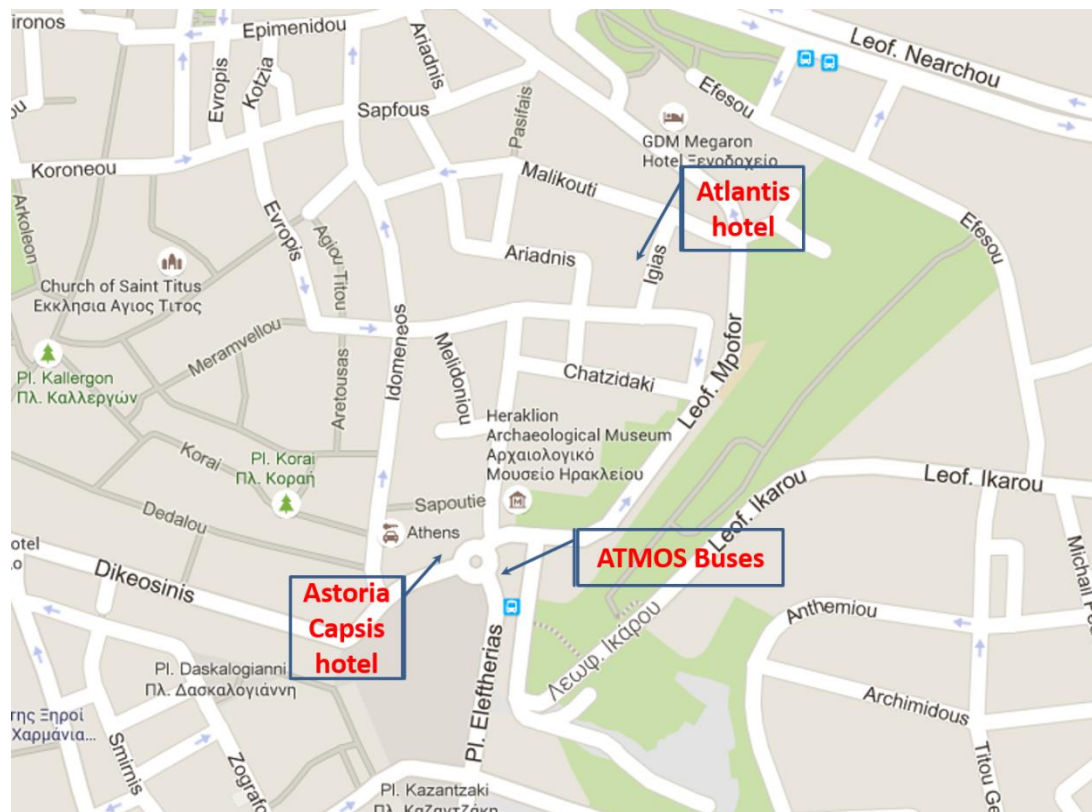
11:10	11:25	Vertically resolved stratospheric ozone and	D. Degenstein -
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		nitrogen dioxide measurements used for surface air quality prediction	University of Saskatchewan
11:25	11:40	Benchmarking climate model top-of-atmosphere radiance in the 9.6 micron ozone band compared to TES and IASI observations	H. Worden - NCAR
11:40	12:15	<b>DISCUSSION</b>	
12:15	12:15	<b>Discussion Summaries</b>	
12:15	12:30	<b>GHGs and Future Missions</b>	
12:30	12:45	<b>Reactive Gases</b>	
12:45	13:00	<b>Preparation for Sentinel S5P/Air Quality</b>	
13:00	13:15	<b>Clouds/Aerosols</b>	
13:15	13:20	<b>Closing</b>	

### ATMOS 2015 buses

From Downtown to the University: Departure from “Eleftherias square’ at 8:00 in the morning.

From the University to Downtown: Departure after the meeting next to the Manassaki Amphitheatre.





# UNIVERSITY OF CRETE- VOUTES CAMPUS

## Andrea Kalokairinou Voutes, Heraklion, Greece

*On Campus facilities*

