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Aura STM (August 27-29, 2019; Pasadena, CA)

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Oral Presentation Format

- *Invited talks:* 20 min each (= 15 min for presentation + 3 min for questions + 2 min for switching speakers)
- *Contributed talks:* 10 min each (= 8 min for presentation + 0 min for questions + 2 min for switching speakers). Questions will be held until a 20 min discussion period, which will occur after each block of contributed talks.

Uploading Presentations

A dedicated Mac laptop and computer projector will be available in the conference room and breakout room.

- EITHER email an electronic copy (PowerPoint or pdf) of your presentation to Susan McFadden (susan.k.mcfadden@nasa.gov) ahead of the meeting;
- OR bring it to the meeting and upload it to the laptop before your session.

If you choose the latter option, DO NOT wait until the last minute. If you do, your presentation will be skipped.

Presentation Timer

Presenters will be strictly kept to their allotted times. An electronic timer will be employed.

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Other notes:

- Wireless Internet access will be available.
- The poster boards will be 4' high x 8' wide (= 48"x96" or 120 cm x 240 cm).

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Tuesday August 27

Chair: Bryan Duncan

8:30 – 8:35	Welcome (*Bryan Duncan & Nathaniel Livesey*)
8:35 – 8:50	Aura to Exit the A-Train? (*Dominic Fisher*)
8:50 – 9:20	OMI Update (*Pieternel Levelt*)
9:20 – 9:50	MLS Update (*Nathaniel Livesey*)
9:50 – 10:05	NASA HQ Perspective (*Ken Jucks*)

Chair: Jessica Neu

10:05 – 10:25 *Retrospectives & Looking Forward* (Invited; 20 min each)

- Development of the Aura Mission (*Mark Schoeberl*)

10:25 – 10:55 break

Chair: Jessica Neu

10:55 – 12:00 *Retrospectives & Looking Forward* (Invited; 20 min each+5 min for ALICE)

- How Aura transformed air quality research with a look forward to TROPOMI and geostationary satellites (*Daniel Jacob*)
- Constraining the Earth System with EOS-Aura Observations: Some Examples from the GMAO (*Steven Pawson*)
- What We Have Learned From HIRDLS: Looking Past the Blockage, and to the Future (*John Gille + 5 min for ALICE*)

12:00 – 13:15 lunch

13:15 – 17:45 *ESMO Working Group (open meeting; side room)*

Chair: John Gille

13:15 – 14:35 *Inferring Emissions from Satellite Data* (10 min each; hold questions)

- A Methodology to Constrain Carbon Dioxide Emissions from Coal-fired Power Plants Using Satellite Observations of Co-Emitted Nitrogen Dioxide (*Fei Liu*)
- Satellite (OMI) and surface observations confirm steady decline in US NO_x emissions over the 2005-2017 period (*Rachel Silvern, Daniel Jacob to present*)
- Using OMI NO_2 to infer fossil-fuel emissions of CO_2 from large metropolitan areas in the United States (*Dan Goldberg*)
- Using OMI NO_2 observations to evaluate seasonal trends in NO_x emissions over eastern China: influence of NO_x chemistry (*Viral Shah*)
- SO_2 emissions estimated using OMI SO_2 and NO_2 retrievals (2005-2017) (*Zhen Qu*)
- Reconciling reported NO_x and SO_2 emissions with those derived from OMI and TROPOMI (*Chris McLinden*)

Discussion & Questions for Speakers (20 min)

Chair: Nathaniel Livesey

14:35 – 15:25 *Stratospheric & Mesospheric Processes Part 1* (10 min each; hold questions)

- Doing chemistry with MLS data and the GEOS-StratChem model: towards a multispecies reanalysis of the stratosphere (*Krzysztof Wargan*)
- MLS Observations of Composition in the Stratospheric Plume from the 2017 British Columbia Pyroconvection Event (*Michael Schwartz*)

- Using Aura MLS data to Reinterpret Nearly Half Century of Ozone Record from the Nadir UV Instruments (*PK Bhartia*)
- The Long-Lived Plume of the Pacific Northwest PyroCb Event: Diabatic Lofting and Radiative Effects of Aerosol and Water Vapor (*George Kablick*)
- Fifteen Years of the Atmospheric Chemistry Experiment (ACE) Satellite: Recent Validation and Science Results (*Kaley Walker*)

15:25 – 15:55 break

Chair: Nathaniel Livesey

15:55 – 17:05 *Stratospheric & Mesospheric Processes Part 2* (10 min each; hold questions)

- Solar Cycle Variations in the Stratosphere Observed by Aura/MLS (*Jae Lee*)
- Horizontal winds, potential vorticity, and stratopause characteristics from a mesospheric and upper stratospheric unified dataset (*Luis Millan*)
- Upper tropospheric tropical variations and trends in ozone and carbon monoxide: Microwave Limb Sounder and model results (*Lucien Froidevaux*)
- Using Multi-Decadal Records of Long-Lived Constituents to Understand Dynamical Processes Affecting O_3 Trends (*Anne Douglass*)
- A New OH Dilemma? ---- The Gap Between Model and Aura MLS Observations in Mesospheric OH (*Shuhui Wang*)

Discussion & Questions for Speakers (20 min)

Chair: Ernie Hilsenrath

17:05 – 17:45 *Retrospectives & Looking Forward* (Invited; 20 min each)

- Decadal multi-constituent chemical reanalysis and its applications in air quality and climate research (*Kazuyuki Miyazaki*)
- A review of convection's impact on the TTL and the lower stratosphere as seen in MLS data (*Andrew Dessler*)

STM dinner: "TES – A Celebration of Life"

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Wednesday August 28

Chair: Joanna Joiner

8:30 – 8:40 Sodankylä National Satellite Data Centre (NSDC) and its support to OMI community (*Timo Ryyppö*)

8:40 – 9:00 *Retrospectives & Looking Forward* (Invited; 20 min each)

- OMI, TROPOMI and Climate Studies: Solar Irradiances (*Sergey Marchenko*)

Chair: Johanna Tamminen

9:00 – 10:20 *Troposheric Studies Part 1* (10 min each; hold questions)

- 2005-2016 trends of ozone pollution and formaldehyde columns over China observed by satellites (*Lu Shen*)
- Direct observation of changing NO_x lifetime in North American cities (*Joshua Laughner*)
- Megacity Pollution from Aura TES and OMI and SNPP CrIS (*Karen Cady-Pereira*)
- Boosting the use of air quality satellite data (*Johanna Tamminen*)
- SCOAPE (Satellite Coastal and Oceanic Atmospheric Pollution Experiment): Overview with OMI and Pandora NO_2 Column Comparisons in the Gulf of Mexico, May 2019 (*Anne Thompson*)
- Diagnosing long-term and short-term changes in ozone production sensitivity to precursor emissions: the view from space (*Xiaomeng Jin*)
- Mapping the Oxidizing Capacity of the Global Remote Troposphere (*Glenn Wolfe*)
- Changes in the Diurnal Cycle of Surface Ozone over Four Decades (*Sarah Strode*)

10:20 – 10:50 break

Chair: Johanna Tamminen

10:50 – 11:40 *Tropospheric Studies Part 2* (10 min each; hold questions)

- Using Aura information in NUWRF applications on air quality, water and carbon cycles (*Min Huang*)
- Using satellite data to estimate the conditions for formation of secondary aerosol particles and sulphuric acid concentrations (*Anu-Maija Sundström*)
- (*Owen Cooper*?)

Discussion & Questions for Speakers (20 min)

Chair: Pepijn Veefkind

11:40 – 12:20 *Retrospectives & Looking Forward* (Invited; 20 min each)

- The Origin Story of OMI (*Pieternel Levelt*)
- Observing Gravity Waves and Drag from Aura: The Search for Waves at the Limits of Resolution (*Joan Alexander*)

12:20 – 13:35 lunch

13:35 – 16:25 *Data Systems Working Group (open meeting; side room)*

Chair: Michelle Santee

13:35 – 15:25 *UT/LS* (10 min each; hold questions)

- Space–time variability in UTLS chemical distribution associated with the Asian summer monsoon and process-based retrieval information content evaluations (*Laura Pan*)
- Upper Tropospheric Cloud and Moisture Structures in Relation to Tropical Cyclone Intensity and Intensification Rate (*Hui Su*)

- Improvements of CMIP6 models in simulating the upper-tropospheric water vapor mixing ratio and cloud ice (*Jonathan Jiang*)
- Wave activity in the tropical tropopause layer and lower stratosphere as viewed by Aura MLS and compared to reanalysis data sets (*Alyn Lambert*)
- Using Aura MLS observations to model budget terms, strat-trop fluxes, and surface variability of N_2O (*Daniel Ruiz*)
- A warming tropical central Pacific dries the lower stratosphere (*Qinghua Ding*)
- Impact of convectively detrained ice crystals on the tropical upper troposphere and lower stratosphere (*Eric Jensen for Rei Ueyama*)
- Tropopause laminar cirrus and its role in the lower stratosphere total water budget (*Tao Wang*)
- The intraseasonal variability of carbon monoxide in middle troposphere and lower stratosphere (*King-Fai Li*)

Discussion & Questions for Speakers (20 min)

Chair: Joanna Joiner

15:25 – 16:05 *Retrospectives & Looking Forward* (Invited; 20 min each)

- New perspectives on changes in tropospheric nitrogen dioxide from the OMI and TROPOMI sensors (*Folkert Boersma*)
- Quantifying and confirming our understanding of processes controlling stratospheric ozone: Insights from Aura MLS and OMI (*Michelle Santee*)

16:05 – 19:30 *Pecora Award Reception & Poster Session*

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Thursday August 29

Chair: Pieternel Levelt

8:30 – 9:20 *Convection & Volcanos* (10 min each; hold questions)

- Lightning NO_x Production Estimated from OMI and TROPOMI NO_2 Observations (*Kenneth Pickering*)
- The 2005 Amazonia drought induced forest legacy effect delays the 2006 wet season onset (*Mingjie Shi*)
- Estimating Convective Entrainment Rates Associated with Deep Convection Using Aura CO, CloudSat/CALIPSO, and AIRS Observations in Comparison With Two GEOS-5 Simulations (*Hui Su for Ryan Stanfield*)
- A volcanic Aura – observing the magnitude and impact of global SO_2 emissions (*Simon Carn*)

Discussion & Questions for Speakers (10 min)

Chair: Lucien Froidevaux

9:20 – 10:00 *Retrospectives & Looking Forward* (Invited; 20 min each)

- Ozone Trends Science: Building on TES's Legacy and Looking to the Future (*Jessica Neu*)

- Decadal-scale attribution of ozone and methane radiative forcing (*Kevin Bowman*)

Chair: PK Bhartia

10:00 – 10:30 *Retrieval Improvements & New Products Part 1* (10 min each; hold questions)

- Aura Ozone and CO profiles retrieved from combined TES and MLS measurements (*Ming Luo*)
- Harnessing information from new satellite observations of PAN in the troposphere (*Emily Fischer*)
- Global Aerosol Distribution and Trends from the 14-year-long OMI Aerosol Record (*Omar Torres*)

10:30 – 11:00 break

Chair: Joanna Joiner

11:00 – 12:10 *Retrieval Improvements & New Products Part 2* (10 min each; hold questions)

- Surface erythemal UV irradiance in the continental United States derived from ground-based and OMI observations: quality assessment, trend analysis and sampling issues (*Jun Wang*)
- Long-term satellite data records of H_2CO, $C_2H_2O_2$ and H_2O (*Chris Miller*)
- Observations of NO_2 from Aura/OMI: Latest Product Updates and First Comparisons with S5P TROPOMI (*Nick Krotkov*)
- OMI water vapor product from the Smithsonian Astrophysical Observatory (*Huiqun Wang*)
- Characterization of A Joint AIRS and TES Composition Record of HDO, H_2O, CH_4, and CO (*John Worden*)
- Explicit measurements-based aerosol correction for OMI HCHO retrievals (*Yeonjin Jung*)
- An observation-based correction for aerosol effects on nitrogen dioxide column retrievals using the Absorbing Aerosol Index (*Matthew Cooper*)

12:10 – 13:25 lunch

Chair: Kevin Bowman

13:25 – 14:25 *Retrieval Improvements & New Products Part 3* (10 min each; hold questions)

- Benchmarking chemistry-climate model 9.6 micron ozone band top-of-atmosphere (TOA) flux using TES IRK (*Le Kuai*)
- Towards a satellite formaldehyde – in situ hybrid estimate for organic aerosol abundance (*Jin Liao*)
- Global Observations of SO_2 from Aura/OMI: Latest Product Updates and Recent Discoveries (*Can Li*)
- From LEO to GEO: TEMPO as a continuation of OMI, OMPS, TROPOMI, etc. (*Kelly Chance*)

Discussion & Questions for Speakers (20 min)

14:25 – 14:40 Aura Mission Status Briefing (*Dominic Fisher*)

14:40 – 14:50 Data System and Preservation Working Group Report 2019 (*Paul Wagner*)

14:50 – 15:00 Aura STM Closing Remarks (*Bryan Duncan*)

End of Aura Science Team Meeting

15:30-18:00 *OMI Science Team Technical Tag-Up (open meeting)*

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Posters (If the poster was confirmed by the lead author, the text will be in green. If not confirmed, the text will be black; these posters are carried over from the original January agenda.)

Inferring Emissions from Satellite Data

1. Methane anthropogenic emission from point sources over San Joaquin Valley *(Le Kuai)*
2. Exploring the synergistic use of OMI NO_2 data with CO_2 data collected from GOSAT and OCO-2: Current status, challenges and implications for upcoming carbon missions *(Tom Oda)*
3. Lightning NO_2 simulation over the Contiguous US and its effects on satellite NO_2 retrievals *(Qindan Zhu)*

Stratospheric & Mesospheric Processes

4. An Overview of the Polar Processes Chapter of the SPARC Reanalysis Intercomparison Project (S-RIP) Report *(Alyn Lambert)*
5. Is OMI Seeing the Beginning of the Recovery of the Antarctic Ozone Hole? *(Richard McPeters)*
6. Decadal-Scale Variations in Stratospheric Circulation Driven by Seasonal Timing of the Quasi-Biennial Oscillation *(Jessica Neu)*
7. Satellite observations of atmospheric HCFC-142b and the recent decline in its rate of increase *(Patrick Sheese)*
8. Subseasonal variability of the upper troposphere and lower stratosphere composition during boreal summer and its relationship to Asian summer monsoon anticyclone and MJO *(Olga Tweedy)*
9. The Stratospheric Water and Ozone Satellite Homogenized (SWOOSH) database: A long-term database for climate studies *(Karen Rosenlof)*
10. Understanding Extratropical UTLS Ozone Variability in Relation to the Upper Tropospheric Jets and Tropopause: Investigations using Satellite Data in Support of the SPARC OCTAV-UTLS Activity (*Gloria Manney*)

Tropospheric Studies

11. HyTES detection of the ammonia plume from different sources: a wild fire, a power plant, livestock feedlot *(Le Kuai*)
12. Global mean OH estimates inferred from assimilation of space-based observations of CO, O_3, NO_2, HNO_3, and HCHO *(Dylan Jones)*
13. Applying satellite data to NUWRF-Chem modeling analysis during KORUS-AQ *(Min Huang)*
14. Incorporating satellite data into modeling analysis in support of HTAP2 *(Min Huang)*
15. Application of OMI Water Vapor: Forecasting Atmospheric Rivers and Top-Down Canopy Transpiration Flux Estimation (*Amir Souri*)
16. Variations in Global Tropospheric OH Over the Last Several Decades (*Julie Nicely*)

UT/LS

17. Decadal trends of UTLS aerosols and contributions from volcanic and anthropogenic sources *(Mian Chin)*
18. Evolution of Convectively Injected Water Vapor in the Lower Stratosphere During the SEAC^{4}RS Campaign *(Robert Herman)*
19. Characterizing the climatological composition and intraseasonal and interannual variability of the Asian summer monsoon anticyclone using Aura Microwave Limb Sounder measurements *(Michelle Santee)*
20. Near-Saturation Conditions at the Tropical Tropopause: Results from Ticosonde *(Henry Selkirk)*
21. Assessment of Satellite Measurements of Upper Tropospheric Water Vapor *(William Read)*
22. Wide range in climate model radiative transfer calculations of top-of-atmosphere flux sensitivity to tropospheric ozone as compared to TES and IASI satellite derived products *(Helen Worden)*
23. Ozone Variability in the Upper Troposphere/Lower Stratosphere: the Role of Laminae and Filamentary Structures (*Kenneth Minschwaner*)

Retrieval Improvements & New Products

24. Updates and Verification of the OMI Ozone Profile algorithm *(Juseon Bak)*
25. Field-of-view Characterization of the Aura Microwave Limb Sounder using Lunar Surface Radiation *(Richard Cofield)*
26. Evaluating the spectral dependence of geometry-dependent Lambertian-equivalent reflectivity (GLER) over the Oceans using OMI L1B measurements *(Zachary Fasnacht)*
27. Evaluation of the Cloud Parameters in the OMI-MODIS Merged Cloud Product (OMMYDCLD): Cloud Pressures, Cloud Fraction and Cloud Optical Thickness *(Bradford Fisher)*
28. Comparison of Optimal Estimation HDO/H_2O Retrievals from AIRS with ORACLES measurements *(Robert Herman)*
29. Improved Aura-TES PAN retrievals for increased sensitivity to low PAN values *(Susan Kulawik)*
30. An Assessment of the OMI Version 9 Total Column Ozone Satellite Data and Comparisons to Ground-based Measurements *(Gordon Labow)*
31. Why considering only "systematic error" and "random error" (or "accuracy" and "precision") can be problematic – some MLS-based examples *(Nathaniel Livesey)*
32. Evaluation of satellite peroxyacetyl nitrate (PAN) products *(Vivienne Payne)*
33. Geometry-dependent surface Lambertian-equivalent reflectivity (GLER) product: wavelength dependence over land and snow/ice-covered regions *(Wenhan Qin)*
34. Continuing the Aerosol Index data record with TROPOMI: a comparison with OMI and other instruments *(Deborah Stein)*
35. KNMI NO_2-sonde: Overview of recent campaign activities and future plans *(Deborah Stein)*
36. An explicit aerosol correction in the OMI cloud and nitrogen dioxide algorithms based on GEOS-5 aerosol optical properties (*Sasha Vasilkov*)
37. Long-term drift in OMI radiometric calibration in the 15 years on Aura (*David Haffner*)
38. Evaluation of Re-processed Ozonesonde Profiles with Aura's OMI and MLS Data (*Anne Thompson*)
39. Reanalysis of Aura MLS Chemical Observations (*Quentin Errera*)
40. Synergy of Using Nadir and Limb Instruments for Tropospheric ozone monitoring (SUNLIT): overview of the project results (*Johanna Tamminen for Viktoria Sofieva*)

Data Handling, Distribution, & Promotion

41. Public Distribution of Smithsonian Astrophysical Observatory Satellite Observations *(Nassika Dabel)*

42. Data Preservation: the Final Step in the Life Cycle of a Mission *(James Johnson)*
43. Enabling Earth Science Research Through Use of Aura MLS Data with Outside Science Data Products *(Brian Knosp)*
44. GES DISC Aura Mission Data Support Metrics - User Perspectives *(Jennifer Wei)*