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RESEARCH APPOINTMENTS

Assistant Professor

Climate and Space Sciences and Engineering, Applied Physics 2013-present
University of Michigan, Ann Arbor, MI

W. M. Keck Institute for Space Studies Postdoctoral Fellow

Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 2011-2013

EDUCATION

Ph.D., Applied Physics, Harvard University, Cambridge, MA 2011

S.M., Applied Physics, Harvard University, Cambridge, MA 2005

B.A., Physics (with Honors), minor Mathematics, Pomona College, Claremont, CA 2004

HONORS AND AWARDS

NSF CAREER award 2017

NASA New Investigator Program (NIP) in Earth Science award 2014

Early Career Award, Gordon Conference for Atmospheric Chemistry,
Atmospheric Chemistry Colloquium for Emerging Senior Scientists (ACCESS) 2013

W. M. Keck Institute for Space Studies Postdoctoral Fellowship 2011-2013

National Center for Atmospheric Research
Advanced Study Program Postdoctoral Fellowship (Declined) 2011

Outstanding Student Paper Award, Fall Meeting, AGU 2010

National Defense Science and Engineering Graduate (NDSEG) Fellowship 2007-2010

Edmunds Physics Prize, Pomona College 2004

Tileston Physics Prize, Pomona College 2003

AIRBORNE CAMPAIGNS

*East-Coast Outflow Greenhouse Gas study (ECO-GHG), East Coast US, Spring 2018

Offshore oil & gas emissions assessment, Gulf of Mexico, Winter 2018

* Greenhouse Emissions in the Midwest (GEM), Minnesota, Summer 2017; GEM-2, Winter 2018; GEM-3, Spring 2018

** Fertilizer Emissions Airborne Study (FEAST), Colorado & Mississippi River Valley, Spring 2017

* The O₂/N₂ Ratio and CO₂ Airborne Southern Ocean Study (ORCAS), Chile, Winter 2016

** Twin Otter Project Defining Oil/gas Well emissioNs (TOPDOWN), New Mexico** & Pennsylvania*, Spring 2015

* TOPDOWN, North Dakota, Colorado, Spring 2014

* Barnett methane emissions study (Environmental Defense Fund), Denton, TX, Fall 2013

HIAPER Pole to Pole Observations (HIPPO-5), Pole to Pole, Summer-Fall 2011; HIPPO-4, Pole to Pole, Spring-Summer 2011

California Nexus, Research at the Nexus of Air Quality and Climate Change (CALNEX), Ontario, CA, Spring 2010
 HIPPO-2, Pole to Pole, Fall 2009; HIPPO-3, Pole to Pole, Spring 2010;
 HIPPO-1, Pole to Pole, Winter 2009
 Stratosphere-Troposphere Analyses of Regional Transport (START08), Broomfield, CO, Spring 2008
 (* instrument PI and/or mission scientist, ** overall project PI)

TEACHING

Earth System Evolution (AOSS 320, CLIMATE 320), University of Michigan, Fall 2014, 2015, 2016
 Earth System Interactions (AOSS 475), University of Michigan, Winter 2014, 2015, 2016, 2017, 2018
 AOSS Seminar (AOSS 749), University of Michigan, Fall 2014 & Winter 2015
 Science A-30 (The Atmosphere), Teaching Fellow, Prof. Steven Wofsy, Harvard University, 2008
 Physics 11b (Electricity & Magnetism), Teaching Fellow, Prof. Eric Mazur, Harvard University, 2006

SERVICE ACTIVITIES

European Commission Joint Research Centre workshop participant and report co-author “Atmospheric monitoring and inverse modeling for verification of GHG inventories” (2017-2018)
 Japanese National Institute for Environmental Studies (NIES), workshop participant and report co-author “A guidebook on the use of satellite greenhouse gases observation data for verification of greenhouse gases emission inventories” (2017-2018)
 Co-lead for Workshop Towards Addressing Major Gaps in the Global Methane Budget, Linde Center, Caltech (2017)
 World Meteorological Organization Integrated Global GHG Information System (IG³IS) planning & implementation team (2016-present)
 Co-chair of NACP breakout session on “Quantification and attribution of anthropogenic methane emissions in North America” (2015)
 Co-organizer Workshop on Measurements in Oil and Gas Production Regions, NOAA ESRL (2015)
 Public forum on Four Corners methane, Farmington, New Mexico (2015)
 JPL Carbon Cycle & Ecosystems Initiative steering committee member (2013)
 American Geophysical Union member

University of Michigan service:

Faculty transition team for new School of Sustainability at University of Michigan (2016-2017)
 Climate and Space Sciences and Engineering executive committee (2016-present)
 Climate and Space Sciences and Engineering graduate admission committee (2015-present)
 Michigan Geophysical Union judge (2014, 2015)
 University of Michigan College of Engineering Graduate Symposium conference judge (2015)
 Atmospheric, Oceanic and Space Sciences Seminar co-organizer (2014-2015)
 President Schlissel’s committee on Greenhouse Gas Reduction, University of Michigan (2014-2015)
 UM Integrated Assessment on Hydraulic Fracturing in Michigan (consulting member; 2014-2015)
 Qualifying and prospectus exams: Anna Savage (2014, Applied Physics), Ben Isaacoff (2014, Applied Physics), Jamie MacLennan (2014, Applied Physics), Rebecca Craig (2014, Chemistry), Liz Ultee (2015, AOSS), Judit Szente (2015, AOSS), Zach Butterfield (2015, CLaSP), Rahul Gogna (2016, Applied Physics), Samantha Basile (2016/2017, CLaSP), Anthony Torres (2016/2017, CLaSP), Shane Coffing (2017, Applied Physics), Dien Wu (2017, U. of Utah), Brian Swiger (2018, CLaSP)
 PhD committees: Chunpeng Wang (2014, AOSS), Anna Savage (2017, Applied Physics), Rebecca Craig (2018, Chemistry)
 PhD committees chaired/co-chaired: John Ware (2018, Physics)

Review tasks:

Peer reviewer for *Nature*, *PNAS*, *Nature Geoscience*, *Geophysical Research Letters*, *Nature Scientific Reports*, *Atmospheric Chemistry and Physics*, *Journal of Geophysical Research*, *Global Biogeochemical Cycles*, *Environmental Pollution*, *Atmospheric Measurement Techniques*, and *Environmental Science and Technology*

Proposal reviewer (*NSF*, *NERC*, *NSERC*, *Belmont Forum*, *Netherlands Space Office*, *Swedish National Space Board*) & panelist for *NASA* (2013, 2014 [2], 2016)

INVITED SEMINARS

Max Planck Institute for Biogeochemistry, Jena, Germany (2017); University of California- Berkeley, Berkeley Atmospheric Sciences Center Seminar (2017); University of Colorado- Boulder, Atmospheric and Oceanic Sciences (2017); California Institute of Technology, Environmental Science and Engineering (2017); University of Washington, Atmospheric Science (2017); University of Toronto, Center for Global Change Science Distinguished Lecturer Series (2017); Dartmouth College (2017); NASA GMAO, Goddard Space Flight Center (2015); NOAA ESRL Chemical Science Division (2014); University of Michigan, Atmospheric, Oceanic and Space Sciences (2014); UiT The Arctic University of Norway, (CAGE) Centre for Arctic Gas Hydrate, Environment, and Climate (2013); Boston University, Terrestrial Biogeochemistry (2013); Massachusetts Institute of Technology, Civil & Environmental Engineering (2013); University of Michigan, Atmospheric, Oceanic and Space Sciences (2013); Jet Propulsion Laboratory (2013); Pomona College, Physics (2012); UC Irvine, Earth System Science (2012); UCLA, Atmospheric and Oceanic Sciences (2012); Caltech, ESE & Society discussion group (2012); Caltech, Yuk Lunch seminar (2011); Jet Propulsion Laboratory (2011); JAMSTEC, Yokohama, Japan (2010)

PUBLICATIONS

As of 20 June 2018: Google Scholar h-index = 32, total citations = 3826
 Thomson Reuters h-index = 26, total citations = 2591
 (indicates Kort group member)

Submitted/Under Review:

65. Gvakharia A, Kort EA, Smith M, Conley S, *Testing and evaluation of a new airborne system for continuous N₂O, CO₂, CO, and H₂O measurements: the Frequent Calibration High-performance Airborne Observation System (FCHAOS)*, Atmos. Meas. Tech. Disc., submitted, 2018.
64. Ware J, Kort EA, Duren R, Verhulst K, Yadav V, *Detecting Urban Emissions Changes and Events with a Near Real Time Capable Inversion System*, JGR-Atmospheres, submitted, 2018.
63. Zeng ZC, Natraj V, Xu F, Pongetti TJ, Shia RL, Kort EA, Toon GC, Sander SP, Yung YL, *Constraining Aerosol Vertical Profile in the Boundary Layer Using Hyperspectral Measurements of Oxygen Absorption*, Geophysical Research Letters, submitted, 2018.
62. Wu D, Lin JC, Oda T, Ye X, Lauvaux T, Yang EG, Kort EA, *A Lagrangian Approach Towards Extracting Signals of Urban CO₂ Emissions from Satellite Observations of Atmospheric Column CO₂ (XCO₂): X-Stochastic Time-Inverted Lagrangian Transport model ("X-STILT v1.1")*, Geosci. Model Dev. Disc., <https://doi.org/10.5194/gmd-2018-123>, under review, 2018
61. Ye X, Lauvaux T, Kort EA, Oda T, Feng S, Lin JC, Yang E, Wu D, *Constraining fossil fuel CO₂ emissions from urban area using OCO-2 observations of total column CO₂*, Atmos. Chem. Phys. Disc., <https://doi.org/10.5194/acp-2017-1022>, under review, 2017.

Published:

60. Alvarez RA, Zavala-Araiza D, Lyon DR, Allen DT, Barkley ZR, Brandt AR, Davis KJ, Herndon SC, Jacob DJ, Karion A, Kort EA, Lamb BK, Lauvaux T, Maasakkers JD, Marchese AJ, Omara M, Pacala SW, Peischl J, Robinson AL, Shepson PB, Sweeney C, Townsend-Small A, Wofsy SC, Hamburg SP, *Assessment of Methane Emissions from the U.S. Oil and Gas Supply Chain*, Science, 10.1126/science.aar7204, 2018.
59. Gourdji SM, Yadav V, Karion A, Mueller KL, Conley S, Ryerson T, Nehr Korn T, Kort EA, *The Aliso Canyon natural gas leak as a natural tracer experiment: reducing errors in aircraft atmospheric inversion estimates of point-source emissions*, Environmental Research Letters, 13, 045003, 2018.
58. Stephens BB, Long MC, Keeling RF, Kort EA, Sweeney C, Apel EC, Atlas EL, Beaton S, Bent JD, Blake NJ, Bresch JF, Casey J, Daube BC, Diao M, Diaz E, Dierssen H, Donets V, Gao BC, Gierach M, Green R, Haag J, Hayman M, Hills AJ, Hoecker-Martinez MS, Honomichl SB, Hornbrook RS, Jensen JB, Li RR, McCubbin I, McKain K, Morgan EJ, Nolte S, Powers JG, Rainwater B, Randolph K, Reeves M, Schauffler SM, Smith M, Smith K, Stith J, Stossmeister G, Toohey DW, Watt AS, *The O₂/N₂ Ratio and CO₂ Airborne Southern Ocean (ORCAS) Study*, Bull. Amer. Meteor. Soc. doi:10.1175/BAMS-D-16-0206.1, 2018.
57. Barkley ZR, Lauvaux T, Davis KJ, Deng A, Miles NL, Richardson SJ, Cao Y, Sweeney C, Karion A, Smith M, Kort EA, Schwietzke S, Murphy T, Cervone G, Martins D, Maasakkers JD, *Quantifying methane emissions from natural gas production in northeastern Pennsylvania*, Atmos. Chem. Phys., 17, 13941-13966, <https://doi.org/10.5194/acp-17-13941-2017>, 2017.
56. Conley S, Faloona I, Mehrotra S, Suard M, Lenschow DH, Sweeney C, Herndon S, Schwietzke S, Petron G, Pifer J, Kort EA, Schnell R, *Application of Gauss' Theorem to quantify localized surface emissions from airborne measurements of wind and trace gases*, Atmos. Meas. Tech., 10, 3345-3358, <https://doi.org/10.5194/amt-10-3345-2017>, 2017.
55. Thorpe AK, Frankenberg C, Thompson DR, Duren RM, Aubrey AD, Bue BB, Green RO, Gerilowski K, Krings T, Borchard J, Kort EA, Sweeney C, Conley S, Roberts DA, Dennison PE, *Airborne DOAS retrievals of methane, carbon dioxide, and water vapor concentrations at high spatial resolution: application to AVIRIS-NG*, Atmos. Meas. Tech., 10, 3833-3850, <https://doi.org/10.5194/amt-10-3833-2017>, 2017.
54. Smith ML, Gvakharia A, Kort EA, Sweeney C, Conley S, Faloona I, Newberger T, Schnell R, Schwietzke S, Wolter S, *Airborne quantification of methane emissions over the Four Corners region*, Environ. Sci. Technol., doi: 10.1021/acs.est.6b06107, 2017.
53. Gvakharia A, Kort EA, Brandt AR, Peischl J, Ryerson TB, Schwarz JP, Smith ML, Sweeney C, *Methane, black carbon, and ethane emissions from natural gas flares in the Bakken Shale, ND*, Environ. Sci. Technol., doi: 10.1021/acs.est.6b05183, 2017.
52. Cui YY, Brioude J, Angevine WM, Peischl J, McKeen SA, Kim SW, Neuman JA, Henze D, Bousserrez N, Fischer ML, Jeong S, Michelsen HA, Bambha RP, Liu Z, Santoni GW, Daube BC, Kort EA, Frost GF, Ryerson TB, Wofsy SC, Trainer M, *Top-down estimate of methane emissions in California using a mesoscale inverse modeling technique: The San Joaquin Valley*, J. Geophys. Res. Atmos., 122, doi:10.1002/2016JD026398, 2017.
51. Frankenberg C, Thorpe A, Thompson DR, Hulley G, Kort EA, Vance N, Borchardt J, Krings T, Gerilowski K, Sweeney C, Conley S, Bue B, Aubrey A, Hook S, Green R, *Airborne methane remote measurements reveal heavy-tail flux distribution in Four Corners region*, Proceedings of the National Academy of Sciences, doi: 10.1073/pnas.1605617113, 2016.

50. Ware J, Kort EA, DeCola P, Duren R, *Aerosol Lidar Observations of Atmospheric Mixing in Los Angeles: Climatology and Implications for Greenhouse Gas Observations*, J. Geophys. Res., doi: 10.1002/2016JD024953, 2016.
49. Inoue M, Morino I, Uchino O, Nakatsuru T, Yoshida Y, Yokota T, Wunch D, Wennberg PO, Roehl CM, Griffith DWT, Velazco VA, Deutscher NM, Warneke T, Notholt J, Robinson J, Sherlock V, Hase F, Blumenstock T, Rettinger M, Sussmann R, Kyrö E, Kivi R, Shiomi K, Kawakami S, De Mazière M, Arnold SG, Feist DG, Barrow EA, Barney J, Dubey M, Schneider M, Iraci L, Podolske JR, Hillyard P, Machida T, Sawa Y, Tsuboi K, Matsueda H, Sweeney C, Tans PP, Andrews AE, Biraud SC, Fukuyama Y, Pittman JV, Kort EA, and Tanaka T, *Bias corrections of GOSAT SWIR XCO₂ and XCH₄ with TCCON data and their evaluation using aircraft measurement data*, Atmos. Meas. Tech., 9, 3491-3512, doi:10.5194/amt-9-3491-2016, 2016.
48. Kort EA, Smith ML, Murray LT, Gvakharia A, Brandt A, Peischl J, Ryerson TB, Sweeney C, Travis K, *Fugitive emissions from the Bakken shale illustrate role of shale production in global ethane shift*, Geophysical Research Letters, 43, doi:10.1002/2016GL068703, 2016.
47. Peischl J, Karion A, Sweeney C, Kort EA, Smith ML, Brandt AR, Yeskoo T, Aikin KC, Conley SA, Gvakharia A, Trainer M, Wolter S, Ryerson TB, *Quantifying atmospheric methane emissions from oil and natural gas production in the Bakken shale region of North Dakota*, J. Geophys. Res., doi: 10.1002/2015JD024631, 2016.
46. Frankenberg C, Kulawik SS, Wofsy S, Chevallier F, Daube B, Kort EA, O'Dell C, Olsen ET, Osterman G, *Using airborne HIAPER Pole-to-Pole Observations (HIPPO) to evaluate model and remote sensing estimates of atmospheric carbon dioxide*, Atmos. Chem. Phys., 16, 7867-7878, doi:10.5194/acp-16-7867-2016, 2016.
45. Hopkins FM, Kort EA, Bush SE, Ehleringer JR, Lai CT, Blake DR, Randerson JT, *Spatial patterns and source attribution of urban methane in the Los Angeles Basin*, J. Geophys. Res., 121, doi: 10.1002/2015JD024429, 2016.
44. Patra PK, Saeki T, Dlugokencky EJ, Ishijima K, Umezawa T, Ito A, Aoki S, Morimoto S, Kort EA, Crotwell A, Ravi Kumar K, Nakazawa T, *Regional methane emission estimation based on observed atmospheric concentrations (2002-2012)*, Journal of the Meteorological Society of Japan, 2016, 94 (1), pp. 91-113, doi: 10.2151/jmsj.2016-006, 2016.
43. Zavala-Araiza D, Lyon DR, Alvarez RA, Davis KJ, Harriss R, Herndon SC, Karion A, Kort EA, Lamb BK, Lan X, Marchese AJ, Pacala SW, Robinson AL, Shepson PB, Sweeney C, Talbot R, Townsend-Small A, Yacovitch TI, Zimmerle D, Hamburg SP, *Reconciling divergent estimates of oil and gas methane emissions*, Proceedings of the National Academy of Sciences, doi:10.1073/pnas.1522126112, 2015.
42. Schwarz JP, Holloway JS, Katich JM, McKeen S, Kort EA, Smith ML, Ryerson TB, Sweeney C, Peischl J, *Black Carbon Emissions from the Bakken Oil and Gas Development Region*, Environ. Sci. Technol. Lett., doi: 10.1021/acs.estlett.5b00225, 2015.
41. Smith ML, Kort EA, Karion A, Sweeney C, Herndon SC, Yacovitch TI, *Airborne ethane observations in the Barnett Shale: Quantification of ethane flux and attribution of methane emissions*, Environ. Sci. Technol., doi: 10.1021/acs.est.5b00219, 2015.
40. Karion A, Sweeney C, Kort EA, Shepson PB, Brewer A, Cambaliza M, Conley S, Davis K, Deng A, Hardesty M, Herndon SC, Lauvaux T, Lavoie T, Lyon D, Newberger T, Petron G, Rella C, Smith M, Wolter S, Yacovitch TI, Tans P, *Aircraft-based estimate of total methane emissions from the Barnett Shale region*, Environ. Sci. Technol., doi: 10.1021/acs.est.5b00217, 2015.

39. Wells KC, Millet DB, Bousseres N, Henze DK, Chaliyakunnel S, Griffis TJ, Luan Y, Dlugokencky EJ, Prinn RG, O'Doherty S, Weiss RF, Dutton GS, Elkins JW, Krummel PB, Langenfelds R, Steele LP, Kort EA, Wofsy SC, Umezawa T, *Simulations of atmospheric N₂O with GEOS-Chem and its adjoint: evaluation of observational constraints*, *Geosci. Model Dev.*, 8, 3179-3198, doi: 10.5194/gmd-8-3179-2015, 2015.
38. Deng F, Jones DBA, Walker TW, Keller M, Bowman KW, Henze DK, Nassar R, Kort EA, Wofsy SC, Walker KA, Bourassa AE, Degenstein DA, *Sensitivity analysis of the potential impact of discrepancies in stratosphere-troposphere exchange on inferred sources and sinks of CO₂*, *Atmos. Chem. Phys.*, 15, 11773-11788, doi: 10.5194/acp-15-11773-2015, 2015.
37. Cui YY, Brioude J, McKeen SA, Angevine WM, Kim SW, Frost GJ, Ahmadov R, Peischl J, Bousseres N, Liu Z, Ryerson TB, Wofsy SC, Santoni GW, Kort EA, Fischer ML, Trainer M, *Top-down estimates of methane emissions in California using a mesoscale inverse modeling technique: I. The South Coast Air Basin*, *J. Geophys. Res.*, 120, doi: 10.1002/2014JD023002, 2015.
36. Wong KW, Fu D, Pongetti TJ, Newman S, Kort EA, Duren R, Hsu Y-K, Miller CE, Yung YL, Sander SP, *Mapping CH₄: CO₂ ratios in Los Angeles with CLARS-FTS from Mount Wilson, California*, *Atmos. Chem. Phys.*, 15, 241-252, doi:10.5194/acp-15-241-2015, 2015.
35. Alexe, M, Bergamaschi P, Segers A, Detmers R, Butz A, Hasekamp O, Guerlet S, Parker R, Boesch H, Frankenberg C, Scheepmaker RA, Dlugokencky E, Sweeney C, Wofsy SC, Kort EA, *Inverse modeling of CH₄ emissions for 2010-2011 using different satellite retrieval products from GOSAT and SCIAMACHY*, *Atmos. Chem. Phys.*, 15, 113-133, doi:10.5194/acp-15-113-2015, 2015.
34. Gray JM, Frohling S, Kort EA, Ray DK, Kucharik CJ, Ramankutty N, Friedl MA, *Direct human influence on atmospheric CO₂ seasonality from increased cropland productivity*, *Nature*, 515 (7527), 398-401, doi:10.1038/nature13957, 2014.
33. Kort EA, Frankenberg C, Costigan KR, Lindemaier R, Dubey MK, Wunch D, *Four Corners: the largest US methane anomaly viewed from space*, *Geophysical Research Letters*, 41 (19), 6898-6903, doi:10.1002/2014GL061503, 2014.
32. Inoue M, Morino I, Uchino O, Miyamoto Y, Saeki T, Yoshida Y, Yokota T, Sweeney C, Tans PP, Biraud SC, Machida T, Pittman JV, Kort EA, Tanaka T, Kawakami S, Sawa Y, Tsuboi K, Matsueda H, *Validation of XCH₄ derived from SWIR spectra of GOSAT TANSO-FTS with aircraft measurement data*, *Atmos. Meas. Tech.*, 7, 2987-3005, doi:10.5194/amt-7-2987-2014, 2014.
31. Hutyra LR, R Duren, KR Gurney, N Grimm, EA Kort, E Larson, G Shrestha, *Urbanization and the carbon cycle: Current capabilities and research outlook from the natural sciences perspective*, *Earth's Future*, doi: 10.1002/2014EF000255, 2014.
30. Yacovitch TI, Herndon SC, Roscioli JR, Floerchinger C, McGovern RM, Agnese M, Petron G, Kofler J, Sweeney C, Karion A, Conley SA, Kort EA, Nahle L, Fischer M, Hildebrandt L, Koeth J, McManus BJ, Nelson DD, Zahniser M, Kolb CE, *Demonstration of an Ethane Spectrometer for Methane Source Identification*, *Environ. Sci. Tech.*, 48 (14), pp 8028-8034, doi: 10.1021/es501475q, 2014.
29. Brandt AR, Heath GA, Kort EA, O'Sullivan F, Petron G, Jordaan SM, Tans P, Wilcox J, Gopstein AM, Arent D, Wofsy S, Brown NJ, Bradley R, Stucky GD, Eardley D, Harriss R, *Methane Leaks from North American Natural Gas Systems*, *Science*, 343(6172), 733-735, 2014.
28. Miller SM, Worthy DEJ, Michalak AM, Wofsy SC, Kort EA, Havice TC, Andrews AE, Dlugokencky EJ, Kaplan JO, Levi PJ, Tian H, Zhang B, *Observational constraints on the distribution, seasonality, and environmental predictors of North American boreal methane emissions*, *Global Biogeochemical Cycles*, doi: 10.1002/2013GB004580, 2014.

27. Houweling S, Krol M, Bergamaschi P, Frankenberg C, Dlugokencky EJ, Morino I, Notholt J, Sherlock V, Wunch D, Beck V, Gerbig C, Chen H, Kort EA, Rockmann T, Aben I, *A multi-year methane inversion using SCIAMACHY, accounting for systematic errors using TCCON measurements*, Atmos. Chem. Phys., 14, 3991-4012, doi:10.5194/acp-14-3991-2014, 2014.
26. Deng F, Jones DBA, Henze DK, Bousserez N, Bowman KW, Fisher JB, Nassar R, O'Dell C, Wunch D, Wennberg PO, Kort EA, Wofsy SC, Blumenstock T, Deutscher NM, Griffith D, Hase F, Heikkinen P, Sherlock V, Strong K, Sussmann R, Warneke T, *Inferring regional sources and sinks of atmospheric CO₂ from GOSAT XCO₂ data*, Atmos. Chem. Phys., 14, 3703-3727, doi:10.5194/acp-14-3703-2014, 2014.
25. Santoni GW, Daube BC, Kort EA, Jimenez R, Park S, Pittman JV, Gottlieb E, Xiang B, Zahniser MS, Nelson DD, McManus JB, Peischl J, Ryerson TB, Holloway JS, Andrews AE, Sweeney C, Hall BD, Hintsa EJ, Moore FL, Elkins JW, Stephens BB, Wofsy SC, *Evaluation of the Airborne Quantum Cascade Laser Spectrometer (QCLS) measurements of the carbon and greenhouse gas suite— CO₂, CH₄, N₂O, and CO – during the CalNex and HIPPO campaigns*, Atmos. Meas. Tech., 7, 1509-1526, doi:10.5194/amt-7-1509-2014, 2014.
24. Miller SM, Wofsy SC, Michalak AM, Kort EA, Andrews AE, Biraud S, Dlugokencky E, Eluszkiewicz J, Fischer ML, Janssens-Maenhout G, Miller BR, Miller, JB, Montzka S, Nehrkorn T, and Sweeney C, *Anthropogenic emissions of methane in the United States*, Proceedings of the National Academy of Sciences, doi:10.1073/pnas.1314392110, 2013.
23. Worden J, Jiang Z, Jones DBA, Alvarado M, Bowman K, Frankenberg C, Kort EA, Kulawik SS, Lee M, Liu J, Payne V, Wecht K, and Worden H, *El Nino, the 2006 Indonesian peat fires, and the distribution of atmospheric methane*, Geophysical Research Letters, 40, doi:10.1002/grl.50937, 2013.
22. Graven HD, Keeling RF, Piper SC, Patra PK, Stephens BB, Wofsy SC, Welp LR, Sweeney C, Tans PP, Kelley JJ, Daube BC, Kort EA, Santoni GW, and Bent JD, *Enhanced seasonal exchange of CO₂ by northern ecosystems since 1960*, Science, DOI: 10.1126/science.1239207, 2013.
21. Bergamaschi P, Houweling S, Segers A, Krol M, Frankenberg C, Scheepmaker RA, Dlugokencky E, Wofsy SC, Kort EA, Sweeney C, Schuck T, Brenninkmeijer C, Chen H, Beck V, and Gerbig C, *Atmospheric CH₄ in the first decade of the 21st century: Inverse modeling analysis using SCIAMACHY satellite retrievals and NOAA surface measurements*, J. Geophys. Res., doi: 10.1002/jgrd.50480, 2013.
20. Kort EA, Angevine W, Duren R, Miller CE, *Surface observations for monitoring urban fossil fuel CO₂ emissions: minimum site location requirements for the Los Angeles megacity*, J. Geophys. Res., 118(3), 1577-1584, doi: 10.1002/jgrd.50135, 2013.
19. Kulawik SS, Worden JR, Wofsy SC, Biraud SC, Nassar R, Jones DBA, Olsen ET, Jimenez R, Park S, Santoni GW, Daube BC, Pittman JV, Stephens BB, Kort EA, Osterman GB, and the TES team, *Comparison of improved Aura Tropospheric Emission Spectrometer (TES) CO₂ with HIPPO and SGP aircraft profile measurements*, Atmos. Chem. Phys., 13, 3205-3225, doi:10.5194/acp-13-3205-2013, 2013.
18. Xiang B, Miller SM, Kort EA, Santoni GW, Daube BC, Commane R, Pittman JV, Angevine W, Ryerson T, Trainer M, Andrews AE, Nehrkorn T, and Wofsy SC, *Nitrous Oxide (N₂O) Emissions from California based on 2010 CalNex Airborne Measurements*, J. Geophys. Res., 118(7), 2809-2820, doi: 10.1002/jgrd.50189, 2013.
17. Worden J, Wecht K, Frankenberg C, Alvarado M, Bowman K, Kort E, Kulawik S, Lee M, Payne V, Worden H, *CH₄ and CO distributions over tropical fires as observed by the Aura TES satellite*

- instrument and modeled by GEOS-Chem*, Atmos. Chem. Phys., 13, 3679-3692, doi:10.5194/acp-13-3679-2013, 2013.
16. Newman S, Jeong S, Fischer ML, Xu X, Haman CL, Lefer B, Alvarez S, Rappenglueck B, Kort EA, Andrews AE, Peischl J, Gurney KR, Miller CE, and Yung YL, *Diurnal tracking of anthropogenic CO₂ emissions in the Los Angeles basin mega-city during spring, 2010*, Atmos. Chem. Phys., 13, 4359-4372, doi:10.5194/acp-13-4359-2013, 2013.
 15. Tian H, Lu C, Guangsheng C, Tao B, Pan S, Del Grosso SJ, Xu X, Bruhwiler L, Wofsy SC, Kort EA, and Prior SA, *Contemporary and projected terrestrial methane and nitrous oxide budgets in North America*, National Climate Assessment Biogeochemistry Special Issue, Frontiers in Ecology and the Environment, 10(10), 528-536, doi:10.1890/120057, 2012.
 14. Kort EA, Frankenberg C, Miller CE, and Oda T, *Space-based Observations of Megacity Carbon Dioxide*, Geophysical Research Letters, Vol. 39, L17806, doi: 10.1029/2012GL052738, 2012.
 13. Wennberg PO, Mui W, Wunch D, Kort EA, Blake DR, Atlas EL, Santoni GW, Wofsy SC, Diskin GS, Jeong S, and Fischer ML, *On the Sources of Methane to the Los Angeles Atmosphere*, Environmental Science and Technology, 46 (17), pp 9282-9289, doi: 10.1021/es301138y, 2012.
 12. Kort EA, Wofsy SC, Daube BC, Diao M, Elkins JW, Gao RS, Hintsaj E, Hurst DF, Jimenez R, Moore FL, Spackman JR, and Zondlo MA, *Atmospheric observations of high latitude Arctic Ocean methane emissions up to 82°north*, Nature Geoscience, 5, 318-321, doi:10.1038/ngeo1452, 2012.
 11. Miller SM, Kort EA, Hirsch AI, Dlugokencky EJ, Andrews AE, Xu X, Tian H, Nehrkorn T, Eluszkiewicz J, Michalak AM, and Wofsy SC, *Regional sources of nitrous oxide over the United States: seasonal variation and spatial distribution*, J. Geophys. Res., 117, D06310, doi:10.1029/2011JD016951, 2012.
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PRESENTATIONS & POSTERS (*invited)

(indicates Kort group member)

- Kort EA, Gvakharia A, Plant G, Smith ML, Conley S, *The 2017 Fertilizer Emissions Airborne Study (FEAST): Quantifying N₂O emissions from croplands and fertilizer plants in the Mississippi River Valley*, NSF Atmospheric Chemistry Principal Investigator meeting, Boulder, 2018.
- Kort EA, Gvakharia A, Smith ML, Conley S, Frauhammer K, *The 2017 Fertilizer Emissions Airborne Study (FEAST): Quantifying N₂O emissions from croplands and fertilizer plants in the Mississippi River Valley*, AGU Fall Meeting, New Orleans, 2017.
- Gvakharia A, Kort EA, Smith ML, Conley S, *Airborne testing and demonstration of a new flight system based on an Aerodyne N₂O-CO₂-CO-H₂O mini-spectrometer*, AGU Fall Meeting, New Orleans, 2017.
- Yang EG, Kort EA, Ware JF, Ye X, Lauvaux T, Wu D, Lin JC, Oda T, *Using OCO-2 observations and Lagrangian modeling to constrain urban carbon dioxide emissions in the Middle East*, AGU Fall Meeting, New Orleans, 2017.
- Ye X, Lauvaux T, Kort EA, Oda T, Feng S, Lin J, Yang EG, Wu D, Elderling A, *Quantifying global fossil-fuel CO₂ emissions: from OCO-2 to optimal observing designs*, AGU Fall Meeting, New Orleans, 2017.
- Wozniak M, Steiner A, Ault A, Kort EA, Lersch T, Casuccio G, *Lidar measurements of boundary layer depolarization and CCSEM-EDX compositional analysis of airborne particles on collocated passive samplers throughout the forest canopy during the 2016 airborne pollen season at UMBS, Pellston, MI*, AGU Fall Meeting, New Orleans, 2017.

- Gourdji SM, Yadav V, Karion A, Mueller KL, Kort EA, Conley S, Ryerson T, Nehrkorn T, *Quantifying point source emissions with atmospheric inversions and aircraft measurements: the Aliso Canyon natural gas leak as a tracer experiment*, AGU Fall Meeting, New Orleans, 2017.
- Wu D, Lin J, Oda T, Ye X, Lauvaux T, Yang EG, Kort EA, *Towards Interpreting the Signal of CO₂ Emissions from Megacities by Applying a Lagrangian Receptor-oriented Model to OCO-2 XCO₂ data*, AGU Fall Meeting, New Orleans, 2017.
- McKain K, Sweeney C, Newberger T, Daube B, Stephens BB, Kort E, Commane R, Wofsy SC, Morgan EJ, Bent JD, Keeling RF, Montzka S, *Adaptation of a commercial greenhouse gas analyser for airborne measurements with expanded altitude range and application on the ORCAS and ATom campaigns*, GGMT, Switzerland, 2017.
- Vogel FR, Turnbull J, Kort E, Gurney K, DeCola P, Tarasova O, and the IG3IS team, *Integrated urban Greenhouse Gas Information System: Advances in the urban GHG monitoring implementation plan and results of previous and current city-scale studies*, GGMT, Switzerland, 2017.
- Stephens BB, Long MC, Keeling RF, Sweeney C, Kort EA, Morgan EJ, Bent JD, McKain K, Mikaloff-Fletcher S, Patra P, *Atmospheric oxygen constraints on Southern Ocean air-sea CO₂ flux seasonality*, ICDC10, Switzerland, 2017.
- McKain K, Sweeney C, Long M, Stephens B, Kort E, Morgan E, Bent J, Keeling R, *Using large-scale vertical gradients of atmospheric trace gases to constrain air-sea CO₂ fluxes in the Southern Ocean*, ICDC10, Switzerland, 2017.
- *Kort EA, Stephens BB, Long MC, Keeling R, Sweeney C, and the ORCAS Science Team, *Early Results from ORCAS: The O₂/N₂ Ratio and CO₂ Airborne Southern Ocean Study*, American Meteorological Society Annual Meeting, Seattle, 2017.
- Kort EA, Yang E, Ware J, Ye X, Lauvaux T, Wu D, Lin J, Oda T, *Towards constraining megacity fossil-fuel emissions estimates with OCO-2 observations and Lagrangian modeling*, American Geophysical Union Fall meeting, San Francisco, 2016.
- Hoecker-Martinez M, Kort EA, Long M, Stephens B, *Using Lagrangian flights and modeling to study O₂ and CO₂ fluxes over the Southern Ocean during the O₂/N₂ Ratio and CO₂ Airborne Study (ORCAS)*, American Geophysical Union Fall meeting, San Francisco, 2016.
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- Smith M, Kort EA, Gvakharia A, Sweeney C, Conley S, *Airborne Quantification of Methane Emissions over the Four Corners Region*, American Geophysical Union Fall meeting, San Francisco, 2016.
- Thorpe A, Frankenberg C, Thompson D, Duren R, Aubrey A, Bue B, Green R, Gerilowski K, Krings T, Borchardt J, Kort EA, Sweeney C, Conley S, Roberts D, Dennison P, Ayasse A, *Attributing Methane and Carbon Dioxide Emissions from Anthropogenic and Natural Sources Using AVIRIS-NG*, American Geophysical Union Fall meeting, San Francisco, 2016.

- Ware J, Yadav V, Mueller K, Kort EA, Verhulst K, *Robustness to Atmospheric Transport Error in Urban Greenhouse Gas Flux Inversion: a Los Angeles Case Study*, American Geophysical Union Fall meeting, San Francisco, 2016.
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- Barkley Z, Lauvaux T, Davis K, Deng A, Miles N, Richardson S, Martins D, Cao Y, Sweeney C, McKain K, Schwietzke S, Smith M, Kort EA, *Top-down Estimate of Methane Emissions from Natural Gas Production in Northeastern Pennsylvania Using Aircraft and Tower Observations*, American Geophysical Union Fall meeting, San Francisco, 2016.
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- Ware J, Kort E, Duren R, DeCola P, *Remote Sensing of Urban Mixed Layer Structure in Los Angeles, with Applications to Greenhouse Gas Emissions Quantification*, American Geophysical Union Fall meeting, San Francisco, 2015.
- Gvakharia A, Kort E, Sweeney C, Peischl J, Ryerson T, Brandt A, Smith M, *Quantitative airborne assessment of gas flaring combustion efficiency in the Bakken Shale*, American Geophysical Union Fall meeting, San Francisco, 2015.
- Smith M, Kort E, Karion A, Sweeney C, Gvakharia A, *Quantification of Methane and Ethane Emissions from the San Juan Basin*, American Geophysical Union Fall meeting, San Francisco, 2015.
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- Kort EA et al., *OCO-2, megacities, and mixed layer depths*, Los Angeles – Paris Megacities Carbon project meeting, Paris, France, 2015.
- Ware J, Kort EA, DeCola P, Duren R, *PBL observations and analysis*, Megacities Carbon Project Workshop, Pasadena, CA, 2015.
- Kort EA et al., *OCO-2 spatial gradient studies*, Megacities Carbon Project Workshop, Pasadena, CA, 2015.
- *Kort EA, Smith M, Gvakharia A, Sweeney C, Karion A, Peischl J, Ryerson T, Frankenberg C, Dubey M, *Locating, quantifying, and attributing methane emissions from fossil-fuel extraction*, American Chemical Society National Meeting, Denver, CO, 2015.
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- *Kort EA, Ware J, Duren R, Schimmel D, Miller CE, DeCola P, *Informing urban carbon emissions with atmospheric observations: motivation, methods, and reducing uncertainties*, AGU Fall meeting, San Francisco, 2014.
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- *Graven H, Keeling R, Piper S, Patra P, Stephens B, Wofsy S, Welp L, Sweeney C, Tans P, Kelley J, Daube B, Kort E, Santoni G, Bent J, Thomas R, Prentice I, *Enhanced Seasonal Exchange of CO₂ by Northern Ecosystems—Observations and Models*, AGU Fall meeting, San Francisco, 2014.
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- Mielke-Maday I, Petron G, Miller B, Frost G, Peischl J, Kort E, Smith M, Karion A, Dlugokencky E, Montzka S, Sweeney C, Ryerson T, Tans P, Schnell R, *Hydrocarbon emissions in the Bakken oil field in North Dakota*, AGU Fall meeting, San Francisco, 2014.

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- Bent J, Keeling R, Stephens B, Wofsy S, Daube B, Kort E, Pittman J, Jimenez-Pizarro R, Santoni G, *Observations of a stratospheric depletion and annual mean interhemispheric gradient in the atmospheric Ar/N₂ ratio from the HIPPO Global campaign*, AGU Fall meeting, San Francisco, 2014.
- *Wofsy SC, Kort E, Crosson E, Keutsch F, *Recent developments in measurements of atmospheric trace gases*, CLEO: Science and Innovations, 2014.
- Kort EA, Smith ML, Karion A, Sweeney C, Frankenberg C, Wunch D, Costigan K, Lindenmaier R, Dubey M, *New Space-based and Airborne measurements and approaches to quantify and attribute Methane emissions*, Global Emissions Initiative (GEIA) conference, Boulder, CO, 2014.
- Kort EA, Frankenberg C, Wunch D, Costigan K, Lindenmaier R, Dubey M, *Space-based observations of anomalous methane emissions: Four Corners*, IWGGMS10, Noordwijk, Netherlands, 2014.
- Wong C, Fu D, Pongetti T, Newman S, Kort E, Duren R, Hsu YK, Miller C, Yung Y, Sander S, *Tracking greenhouse gas emissions from a US megacity by remote sensing from a mountaintop site*, EGU General Assembly Conference, Vienna, 2014.
- *Kort EA, et al., *Why and how to use atmospheric observations to study carbon emissions from LA and other megacities*, AGU Fall meeting, San Francisco, 2013.
- *Kort EA, et al., *Towards resolving North America's methane mystery with atmospheric observations*, AGU Fall meeting, San Francisco, 2013.
- Hopkins FM, Randerson JT, Bush S, Ehleringer JR, Lai C, Kort EA, Blake DR, *Methane Hotspots in the Los Angeles Megacity*, AGU Fall meeting, San Francisco, 2013.
- Dubey M, Lindenmaier R, Arata C, Costigan KR, Frankenberg C, Kort EA, Rahn TA, Henderson BG, Love SP, Aubrey AD, *Field Observations of Methane Emissions from Unconventional and Conventional Fossil Fuel Exploration*, AGU Fall meeting, San Francisco, 2013.
- Kort EA, Frankenberg C, Miller CE, Dubey M, Costigan K, Lindenmaier R, *Earth and Space-based observations of CO₂ and CH₄ to quantify and attribute anthropogenic emissions*, Gordon Research Conference, Mt. Snow, VT, 2013. (poster)
- Wong KW, Fu D, Sander S, Pongetti T, Kort E, Newman S, Yung Y, *Mapping greenhouse gas emissions in the Los Angeles basin by remote sensing using a Fourier Transform Spectrometer on Mt. Wilson*, EGU General Assembly Conference, Vienna, 2013.
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- Duren RM, Kort EA, Miller CE, *The Megacities Carbon Project: measuring urban carbon emissions*, AGU Fall meeting, San Francisco, 2012.
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- Perring AE, Schwarz JP, Spackman JR, Gao R, Watts LA, Daube B, Santoni GW, Kort EA, Pittman JV, Wofsy SC, Fahey DW, *An analysis of black carbon in the northern Pacific*, AGU Fall meeting, San Francisco, 2012.
- Hints EJ, Moore FL, Dutton GS, Hall BD, Nance JD, Hurst DF, Novelli PC, Elkins JW, Daube B, Kort EA, Pittman JV, Santoni GW, Jaegle L, *The Atmospheric Distribution of Molecular Hydrogen*

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- Kort EA, Frankenberg C, Miller CE, *Space-based Observations of Megacity Carbon Dioxide*, IWGGMS8, Caltech, 2012.
- Kort EA, *Urban CO₂ and CH₄ source attribution and network sensitivity*, Megacities Carbon Project workshop, Caltech, Pasadena, CA 2012.
- Kort EA, *Estimating emissions trends from Atmospheric Concentrations*, Megacities Carbon Project workshop, Caltech, Pasadena, CA 2012.
- Kort EA, Miller CE, Duren R, Eldering A, Sander S, Newman S, *Megacity Carbon: Observing system study for tracking Los Angeles greenhouse gas emission trends*, EGU Meeting, Vienna, Austria, 2012.
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- Kort EA, *Arctic methane: that which comes from the sea*, HIPPO Science Team Meeting, Boulder, CO, 2012.
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- Payne V, Xiao Y, Eluszkiewicz J, Henderson J, Nehrkorn T, Sweeney C, Andrews AE, Worden J, Kulawik S, Worthy D, Shephard MW, Wofsy SC, Kort EA, Wecht K, Tian H, *Constraints on High-Latitude Regional Methane Fluxes Through Integration of Satellite, Aircraft and Ground-Based Observations with Models*, AGU Fall Meeting, San Francisco, CA, 2011.
- Miller SM, Kort EA, Worthy D, Havice TC, Dlugokencky EJ, Andrews AE, Wofsy SC, *Large-scale environmental drivers of North American methane emissions*, AGU Fall Meeting, San Francisco, CA, 2011.
- Pan L, Munchak L, Kinnison DE, Wofsy SC, Pittman JV, Kort EA, Daube B, Atlas EL, *On The Use of in situ Chemical Tracer Measurements in Diagnosing Chemistry Climate Models*, AGU Fall Meeting, San Francisco, CA, 2011.
- Guerrero OJ, Jimenez R, Lin JC, Diskin GS, Sachse GW, Kort EA, Kaplan JO, *Bayesian-inversion adjusted methane fluxes in Colombia and Panama*, AGU Fall Meeting, San Francisco, CA, 2011.
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- Kort EA, *High-resolution Inverse Modeling for LA*, Monitoring CO₂ in Megacities: Paris – Los Angeles workshop, Paris, France, 2011.

- Kort EA, *Atmospheric observations and emissions estimates of methane and nitrous oxide from regional to global scale*, Harvard University, Cambridge, MA, 2011.
- Kort EA, *Non-CO₂ inter-instrument comparisons*, HIPPO science team meeting, Boulder, CO 2011.
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