

Michael J. Newchurch Curriculum Vitae

Air-Quality Remote-Sensing Consulting, LLC 159 Stoneway Trail Madison, AL 35758 Mike.Newchurch@gmail.com (256) 520-1882 http://aqrsc-llc.com	Atmospheric Science Department University of Alabama in Huntsville National Space Science and Technology Center 320 Sparkman Drive Huntsville, Alabama 35805 Voice: (256) 961.7825 mike@nsstc.uah.edu www.nsstc.uah.edu/atmchem/
--	---

PROFESSIONAL PREPARATION

Ph.D. Atmospheric Sciences, Georgia Institute of Technology, 1986
B.S Industrial Sciences, Colorado State University, 1974

APPOINTMENTS

2007-present CEO, Air-Quality Remote-Sensing Consulting, LLC
2005-present Professor, Atmospheric Science Dept., Univ. of AL in Huntsville
2000-2005 Associate Professor, Atmospheric Science Dept., Univ. of AL in Huntsville
1994-2000 Associate Research Professor, Atmospheric Science Dept., Univ. of AL in Huntsville
1991-present Senior Research Scientist, Earth System Science Ctr., Univ. of AL in Huntsville
1988-1994 Adjunct Asst. Professor, Atmospheric Science Dept, Univ. of AL in Huntsville
1999-2002 Affiliate Scientist, Atmospheric Chem Div., National Ctr. Atmospheric Research
1998 Visiting Scientist, Atmospheric Chem Div., National Ctr. Atmospheric Research
1991-1993 Senior Atmospheric Scientist, Teledyne Brown Engineering, Huntsville, AL
1988-1990 Mgr, Geo. Remote-Sensing Section, Teledyne Brown Engineering, Huntsville, AL
1986-1988 Atmospheric Scientist, Teledyne Brown Engineering, Huntsville, AL

RESEARCH SUMMARY

- *Atmospheric Chemistry*: PI: Tropospheric Ozone Lidar Network, TOLNet.
- *Lidar*: Measured ozone profiles with UV DIAL, aerosol profiles with elastic backscatter, wind and aerosol profiles with coherent Doppler wind and aerosol lidar in the RAPCD laboratory. Founding member and PI of the Tropospheric Ozone Lidar Network, TOLNet. Member of Network for Detection of Atmospheric Composition Change, NDACC.
- *Laser Propagation*: Modeled the effects of optical systems (lasers, retroreflectors) and atmospheric properties (refraction, turbulence, scattering, absorption) on laser beam propagation over arbitrary slant ranges, especially between ground-based and satellite-based systems.
- *Satellite Remote Sensing*: Retrieved and validated trace gases (ozone, NO₂, halogens et al.) and aerosol concentrations from numerous satellite (TEMPO, OMPS, OMI, TOMS, SAGE, HALOE, AIRS, ATMOS, POAM, and SBUV) instruments and ground-based (Dobson, Brewer, Umkehr, ozonesonde) systems.
- *Trend Analyses*: Reported the first stage of recovery of the stratospheric ozone layer and quantified the degree and significance of ozone recovery in the upper and lower stratosphere in mid-latitudes, high southern latitudes, and in the Antarctic ozone hole.
- *Trace Gas Measurements*: Supervised the design and implementation of an extractive cryocooled inert preconcentration instrument with FTIR spectroscopy for autonomous measurements of atmospheric organics.

PROFESSIONAL ACTIVITIES

- \$12.9 M total research sponsored by NASA, NOAA, NSF, DOE, NRL, EPA, DOD.
- PI: Tropospheric Ozone Lidar Network (TOLNet).
- Scientific Director: Regional Atmospheric Profiling Center for Discovery, RAPCD, 2002-present.
- Scientific Director, Huntsville Ozone Sonde Station, 1999-present.
- Science Team Memberships: TEMPO, GEO-CAPE, NPP, OMI, AIRS, SAGE I,II,&III, TOMS, ATLAS, ATMOS, POAM.
- Co-Author, WMO 2006 Ozone Assessment.
- Sigma Xi Researcher of the Year 2004, UAH Chapter.
- Invited plenary lecturer to Quadrennial Ozone Symposium (2004), American Geophysical Union (2003), and Gordon Research Conference on Atmospheric Chemistry (2003).
- Member, External Advisory Board, NOAA Cooperative Remote Sensing Science and Technology Center, 2002-present.
- Member, NASA Space Station Utilization Advisory Subcommittee (SSUAS) 1999-2003.
- Advisor to NASA Earth Science Research Director reviewing South Korean National Atmospheric Science Research program (1998).
- Invited to International Ozone Commission Trends Panel (1998).
- Assistant Mission Scientist, ATLAS-2 (1993) and ATLAS-3 (1994).
- NASA Group Achievement Award for ATLAS-2 (1993), ATLAS-3 mission (1994), ICARTT (2005).
- Taught 8 undergraduate and 25 graduate courses at UAH.
- Developed Atmospheric Chemistry graduate curriculum at UAH.
- Advisor to 28 undergraduate students, 16 graduate students, 2 Post-docs, 4 MS degrees, and 7 PhDs.
- Reviewer of papers submitted to the *Atmospheric Environment*, *Journal of Geophysical Research*, *Geophysical Research Letters*, *Journal of Atmospheric Chemistry*, *Journal of Atmospheric Chemistry and Physics*, and *Ocean-Atmospheres*.
- Reviewer of proposals submitted to NASA, NSF, and NSERC Canada.
- Member, Peer-review of LaRC's Atmospheric Composition within the Science Directorate (2008).
- Member, Editorial Section Board for *Atmospheric Remote Sensing* in the journal *Atmospheric Remote Sensing*.

PROFESSIONAL ORGANIZATIONS

- American Geophysical Union (member 25 years)
- American Meteorological Society
- American Chemical Society
- American Academy for the Advancement of Science
- American Institute of Aeronautics and Astronautics
- Optical Society of America
- Sigma Xi

PUBLICATIONS, M. J. NEWCHURCH

Many available at <http://nsstc.uah.edu/atmchem/>

105. Johnson, M. S., X. Liu, P. Zoogman, J. Sullivan, M. J. Newchurch, S. Kuang, T. Leblanc, T. McGee (2018), Evaluation of potential sources of a priori ozone profiles for TEMPO. *Atmos. Meas. Tech.*, 11, 3457-3477, <https://doi.org/10.5194/amt-11-3457-2018>.
104. Langford, A. O., Avarez II, R. J., Brioude, J., Evan, S., Iraci, L. T., Kirgis, G., Kuang, S., Leblanc, T., Newchurch, M. J., Pierce, R. B., Senff, C. J., E. L. Yates (2018), Coordinated profiling of stratospheric intrusions and transported pollution by the Tropospheric Ozone Lidar Network (TOLNet) and NASA Alpha Jet experiment (AJAX): Observations and comparison to HYSPLIT, RAQMS, and FLEXPART, *Atmos. Environ.*, 174, 1-14.
103. De Young, R., W. Carrion, R. Ganoë, D. Pliutau, G. Gronoff, T. Berkoff and S. Kuang (2017), Langley mobile ozone lidar: ozone and aerosol atmospheric profiling for air quality research. *Appl. Opt.*, 56(3), 721-730.
102. Kuang, S., M. J. Newchurch, A. M. Thompson, R. M. Stauffer, B. J. Johnson, L. Wang (2017), Ozone Variability and Anomalies Observed during SENEX and SEAC⁴RS Campaigns in 2013, *J. Geophys. Res. Atmos.*, 122, 11227-11241. <https://doi.org/10.1002/2017JD027139>.
101. Wang, L., M. J. Newchurch, R. J. Alvarez II, T. A. Berkoff, S. S. Brown, W. Carrion, R. D. Young, B. J. Johnson, R. Ganoë, G. Gronoff, G. Kirgis, S. Kuang, A. O. Langford, T. Leblanc, E. E. McDuffie, T. J. McGee, D. Pliutau, C. J. Senff, J. T. Sullivan, G. Sumnicht, L. W. Twigg, A. J. Weinheimer, Quantifying TOLNet Ozone Lidar Accuracy during the 2014 DISCOVER-AQ and FRAPPÉ Campaigns, *Atmos. Meas. Tech.*, 10, 3865-3876, 2017, <https://doi.org/10.5194/amt-10-3865-2017>.
100. Travis, K. R., D. J. Jacob, C. A. Keller, S. Kuang, J. Lin, M. J. Newchurch, A. M. Thompson, Resolving Ozone Vertical gradients in Air Quality Models, *Atmos. Chem. Phys. Discuss.*, <https://doi.org/10.5194/acp-2017-596>, in review, 2017.
99. Huang, G., X. Liu, K. Chance, K. Yang, P. Bhartia, Z. Cai, M. Allaart, G. Ancellet, B. Calpini, G. Coetzee, E. Cuevas, M. Cupeiro, H. Backer, M. K. Dubey, H. E. Fuelberg, M. Fujiwara, S. Godin-Beekmann, T. J. Hall, B. Johnson, M. Yela, ..., M. J. Newchurch, et al., (2017), Validation of 10-year SAO OMI Ozone Profile (PROFOZ) Product using Ozone-sonde Observations, *Atmos. Meas. Tech.*, 10, doi: 10.5194/amt-10-2455-2017.
98. Reid, J. S., R. E. Kuehn, R. E. Holz, E. W. Eloranta, K. C. Kaku, S. Kuang, M. J. Newchurch, A. M. Thompson, C. R. Trepte, J. Zhang, S. A. Atwood, J. L. Hand, B. N. Holben, P. Minnis, D. J. Posselt, (2017), Ground based high spectral resolution lidar observation of aerosol vertical distribution in the summertime Southeast United States: Aerosol vertical distribution, *J. Geophys. Res. Atmos.*, 122, 2970-3004, doi: 10.1002/2016JD025798.
97. Kuang, S., M. J. Newchurch, M. S. Johnson, L. Wang, J. Burris, R. B. Pierce, E. W. Eloranta, I. B. Pollack, M. Graus, J. de Gouw, C. Warneke, T. B. Ryerson, M. Z. Markovic, J. S. Holloway, A. Pour-Biazar, G. Huang, X. Liu, N. Feng, (2017), Summertime tropospheric ozone enhancement associated with a cold front passage due to stratosphere-to-troposphere transport and biomass burning: simultaneous ground-based lidar and airborne measurements, *J. Geophys. Res. Atmos.*, 122, 1293-1311, doi:10.1002/2016JD026078.
96. Zoogman P., X. Liu, R.M. Suleiman, W.F. Pennington, D.E. Flittner, J.A. Al-Saadi, B.B. Hilton, D.K. Nicks, M.J. Newchurch, J.L. Carr, S.J. Janz, M.R. Andraschko, A. Arola, B.D. Baker, B.P. Canova, C. Chan Miller, R.C. Cohen, J.E. Davis, M.E. Dussault, D.P. Edwards, J. Fishman, A. Ghulam, G. Gonzalez Abad, M. Grutter, J.R. Herman, J. Houck, D.J. Jacob, J. Joiner, B.J. Kerridge, J. Kim, N.A. Krotkov, L. Lamsal, C. Li, A. Lindfors, R.V. Martin, C.T. McElroy, C. McLinden, V. Natraj, D.O. Neil, C.R. Nowlan, P.I. Palmer, R.B. Pierce, M.R. Pippin, A. Saiz-Lopez, R.J.D. Spurr, J.J. Szykman, O. Torres, J.P. Veefkind, B. Veihelmann, H. Wang, J. Wang, and K. Chance (2017), Tropospheric emissions: monitoring of pollution (TEMPO), *Journal of Quantitative Spectroscopy and Radiative Transfer*, 186, 17-39.
95. Huang G., X. Liu, K. Chance, K. Yang, P. K. Bhartia, Z. Cai, M. Allaart, B. Calpini, G. J. R. Coetzee, E. Cuevas-Agullo, M. Cupeiro, ..., M. J. Newchurch, etc., (2017), Validation of 10-year SAO OMI

- Ozone Profile (PROFOZ) Product Using Ozone-sonde Observations, Atmospheric Measurement Techniques Discussions, doi:10.5194/amt-2017-15.
94. Johnson, M., S. Kuang, L. Wang, and M.J. Newchurch (2016), Evaluating Summer-Time Ozone Enhancement Events in the Southeast United States, *Atmosphere*, 7(8), 108, doi:10.2290/atmos7080108.
 93. Wang, L., M.B. Follette-Cook, M.J. Newchurch, K.E. Pickering, A. Pour-Biazar, S. Kuang, W. Koshak, and H. Peterson. 2015. "Evaluation of lightning-induced tropospheric ozone enhancements observed by ozone lidar and simulated by WRF/Chem." *Atmospheric Environment* 115: 185-191. doi:10.1016/j.atmosenv.2015.05.054.
 92. Buckley, P.I., D.A. Bowdle, M.J. Newchurch, B.C. Sive, and G. H. Mount. 2015. "Extractive FTIR spectroscopy with cryogen-free low temperature inert preconcentration for autonomous measurements of atmospheric organics: 1: Instrument development and preliminary performance." *Applied Optics* 54(10): 2908-2921. doi: 10.1364/AO.54.002908.
 91. Huang, G., M.J. Newchurch, S. Kuang, P.I. Buckley, W. Cantrell, and L. Wang. 2015. "Definition and determination of ozone laminae using Continuous Wavelet Transform (CWT) analysis" *Atmospheric Environment* 104: 125-131. doi:10.1016/j.atmosenv.2014.12.027.
 90. Koshak, W., H. Peterson, A. Biazar, M. Khan, and L. Wang. 2014. "The NASA Lightning Nitrogen Oxides Model (LNOM): Application to air quality modeling." *Atmospheric Research* 135-136: 363-369. doi: 10.1016/j.atmosres.2012.12.015.
 89. Szykman, J., E. Solazzo, O. Cooper, M. Silverman, C. Trepte, M.J. Newchurch, J. Cammas, and Volz-Thomas, A. 2013. "Profile and remote sensing observation datasets for regional-scale model evaluation under the AQMEII: North American and European perspectives." *EM: Air and Waste Management Association Magazine for Environmental Managers*. 22-29. <http://pubs.awma.org/gsearch/em/2012/7/szykman.pdf>.
 88. Kuang, S., M.J. Newchurch, J. Burris, and X. Liu. 2013. "Ground-based lidar for atmospheric boundary layer ozone measurements." *Applied Optics* 52(15): 3557-3566. <http://dx.doi.org/10.1364/AO.52.003557>.
 87. Bak, J., J. H. Kim, R.J.D Spurr, X. Liu, M.J. Newchurch. 2012. "Sensitivity study of ozone retrieval from UV measurements on geostationary platforms." *Remote Sensing of Environment* 118: 309-319. doi:10.1016/j.rse.2011.11.010.
 86. Fishman, J., L. T. Iraci, J. Al-Saadi, K. Chance, F. Chavez, M. Chin, P. Coble, C. Davis, P.M. DiGiacomo, D. Edwards, A. Eldering, J. Goes, J. Herman, C. Hu, D.J. Jacob, C. Jordan, S.R. Kawa, R. Key, X. Liu, S. Lohrenz, A. Mannino, V. Natraj, D.Neil, J. Neu, M. Newchurch, K. Pickering, J. Salisbury, H. Sosik, A. Subramaniam, M.Tzortziou, J. Wang, M. Wang. 2012. "The United States' Next Generation of Atmospheric Composition and Coastal Ecosystem Measurements: NASA's Geostationary Coastal and Air Pollution Events (GEO-CAPE) Mission." *Bulletin of the American Meteorological Society* 93(10): 1547-1566. doi:<http://dx.doi.org/10.1175/BAMS-D-11-00201.1>.
 85. Kuang, S., M.J. Newchurch, J. Burris, L. Wang, K. Knupp, and G. Huang. 2012. "Stratosphere-to-troposphere transport revealed by ground-based lidar and ozone-sonde at a midlatitude site." *Journal of Geophysical Research* 117: D18305. doi:10.1029/2012JD017695.
 84. Wang, L., M.J. Newchurch, A. Pour-Biazar, S. Kuang, M. Khan, X. Liu, W. Koshak, K. Chance. 2013. "Estimating the influence of lightning on upper tropospheric ozone using NLDN lightning data and CMAQ model." *Atmospheric Environment* 67: 219-228. doi:10.1016/j.atmosenv.2012.11.001.
 83. Bak, J., J.H. Kim, R.J.D. Spurr, X. Liu, M.J. Newchurch. 2012. "Sensitivity study of ozone retrieval from UV measurements on geostationary platforms." *Remote Sensing of Environment* 118: 309-319. doi:10.1016/j.rse.2011.11.010.
 82. Kuang, S., M.J. Newchurch, J. Burris, L. Wang, P.I. Buckley, S. Johnson, K. Knupp, G. Huang, D. Phillips, and W. Cantrell. 2011. "Nocturnal ozone enhancement in the lower troposphere observed by lidar." *Atmospheric Environment* 49(33): 6078-6084. doi:10.1016/j.atmosenv.2011.07.038.
 81. Wang, L., M.J. Newchurch, A. Biazar, X. Liu, S. Kuang, and M. Khan. 2011. "Evaluating AURA/OMI ozone profiles using ozone-sonde data and EPA surface measurements for August 2006." *Atmospheric Environment* 45: 5523-5530. doi:10.1016/j.atmosenv.2011.06.012.
 80. Pour-Biazar, A., M. Khan, L. Wang, Y. Park, M. Newchurch, R. T. McNider, X. Liu, D. W. Byun, and R. Cameron. 2011. "Utilization of satellite observation of ozone and aerosols in providing initial and

- boundary condition for regional air quality studies." *Journal of Geophysical Research* 116(18): D18309. doi:10.1029/2010JD015200.
79. Kim, J.H., S.M. Kim, K.H. Baek, L. Wang, T. Kurosu, I. De Smedt, K. Chance, and M.J. Newchurch. 2011. "Evaluation of satellite-derived HCHO using statistical methods." *Atmospheric Chemistry Discussions* 11: 8003-8025. doi:10.5194/acpd-11-8003-2011.
78. Lamsal, L. N., R. V. Martin, A. Padmanbhan, A. van Donkelaar, Q. Zhang, C. E. Sioris, K. Chance, T. P. Kurosu, and M. J. Newchurch. 2011. "Application of satellite observations for timely updates to global anthropogenic NO_x emission inventories." *Geophysical Research Letters* 38(5): L05810. doi:10.1029/2010GL046476.
77. Hogrefe, C., Hao, W., Zalewsky, E.E., Ku, J.-Y., B. Lynn, C. Rosenzweig, M.G. Schultz, S. Rast, M.J. Newchurch, L. Wang, P.L. Kinney, and G. Sistla. 2011. "An analysis of long-term regional-scale ozone simulations over the Northeastern United States: Variability and trends." *Atmospheric Chemistry and Physics* 11: 567-582. doi:10.5194/acp-11-567-2011.
76. Kuang, S.; J. F. Burris, M. J. Newchurch, S. Johnson, and S. Long. 2011. "Differential absorption lidar to measure subhourly variation of tropospheric ozone profiles." *IEEE Transactions on Geoscience and Remote Sensing* 49(1): 557-571. doi: 10.1109/TGRS.2010.2054834.
75. Jonson, J.E., A. Stohl, A.M. Fiore, P. Hess, S. Szopa, O. Wild, G. Zeng, F.J. Dentener, A. Lupu, M.G. Schultz, B.N. Duncan, K. Sudo, P. Wind, M. Schulz, E. Marmer, C. Cuvelier, T. Keating, A. Zuber, A. Valdebenito, V. Dorokhov, H. De Backer, J. Davies, G.H. Chen, B. Johnson, D.W. Tarasick, R. Stübi, M.J. Newchurch, P. von der Gathen, W. Steinbrecht, and H. Claude. 2010. "A multi-model analysis of vertical ozone profiles." *Atmospheric Chemistry and Physics* 10(12): 5759-5783. doi:10.5194/acp-10-5759-2010.
74. Lightner K.J., W.W. McMillan, K.J. McCann, R.M. Hoff, M.J. Newchurch, E.J. Hintsä, and C.D. Barnett. 2009. "Detection of a tropospheric ozone anomaly using a newly developed ozone retrieval algorithm for an up-looking infrared interferometer." *Journal of Geophysical Research* 114(6): D06304. doi:10.1029/2008JD010270.
73. Yang, E.-S., D.M. Cunnold, M.J. Newchurch, R.J. Salawitch, M.P. McCormick, J.M. Russell III, J.M. Zawodny, and S.J. Oltmans. 2008. "First stage of Antarctic ozone recovery." *Journal of Geophysical Research* 113(20): D20308. doi:10.1029/2007JD009675.
72. Kim, J.H., S. Na, R.V. Martin, K.H. Seo, and M.J. Newchurch. 2008. "Singular value decomposition analyses of tropical tropospheric ozone determined from TOMS." *Geophysical Research Letters* 35(15): L15816. doi:10.1029/2008GL033690.
71. Divakarla, M., C. Barnett, M. Goldberg, E. Maddy, F. Irion, M.J. Newchurch, X. Liu, W. Wolf, L. Flynn, G. Labow, X. Xiong, J. Wei, and L. Zhou. 2008. "Evaluation of Atmospheric Infrared Sounder (AIRS) ozone profiles and total ozone retrievals with matched ozonesonde measurements, ECMWF ozone data, and Ozone Monitoring Instrument (OMI) retrievals." *Journal of Geophysical Research* 113(15): D15308. doi:10.1029/2007JD009317.
70. Nassar, R., J.A. Logan, H.M. Worden, I.A. Megretskaia, K.W. Bowman, G.B. Osterman, A.M. Thompson, D.W. Tarasick, S. Austin, H. Claude, M.K. Dubey, W.K. Hocking, B.J. Johnson, E. Joseph, J. Merrill, G.A. Morris, M.J. Newchurch, S.J. Oltmans, F. Posny, F.J. Schmidlin, H. Vömel, D.N. Whiteman, and J.C. Witte. 2008. "Validation of Tropospheric Emission Spectrometer (TES) nadir ozone profiles using ozonesonde measurements." *Journal of Geophysical Research* 113(15): D15S17. doi:10.1029/2007JD008819.
69. Hopey, J.A., K.A. Fuller, V. Krishnaswamy, D. Bowdle, and M.J. Newchurch. 2008. "Fourier transform infrared spectroscopy of size-segregated aerosol deposits on foil substrates." *Applied Optics* 47(12). doi:10.1364/AO.47.002266
68. Thompson, A.M., J.B. Stone, J.C. Witte, S.K. Miller, R.B. Pierce, R.B. Chatfield, S.J. Oltmans, O.R. Cooper, A.L. Loucks, B.F. Taubman, B.J. Johnson, E. Joseph, T.L. Kucsera, J.T. Merrill, G.A. Morris, S. Hersey, G. Forbes, M.J. Newchurch, F.J. Schmidlin, D.W. Tarasick, V. Thouret, and J-P. Cammas. 2007. "Intercontinental Chemical Transport Experiment Ozonesonde Network Study (IONS) 2004: 1. Summertime upper troposphere/lower stratosphere ozone over northeastern North America." *Journal of Geophysical Research* 112(12): D12S12. doi:10.1029/2006JD007441.
67. Cooper, O.R., M. Trainer, A.M. Thompson, S.J. Oltmans, D.W. Tarasick, J.C. Witte, A. Stohl, S. Eckhardt, J. Lelieveld, M.J. Newchurch, B.J. Johnson, R.W. Portmann, L. Kalnajs, M.K. Dubey, T.

- Leblanc, I.S. McDermid, G. Forbes, D. Wolfe, T. Carey-Smith, G.A. Morris, B. Lefer, B. Rappenglück, E. Joseph, F. Schmidlin, J. Meagher, F.C. Fehsenfeld, T.J. Keating, R.A. Van Curen, and K. Minschwaner. 2007. "Evidence for a recurring eastern North America upper tropospheric ozone maximum during summer." *Journal of Geophysical Research* 112(23): D23304. doi:10.1029/2007JD008710.
66. Jiang, Y.B., L. Froidevaux, A. Lambert, N.J. Livesey, W.G. Read, J.W. Waters, B. Bojkov, T. Leblanc, I.S. McDermid, S. Godin-Beekmann, M.J. Filipiak, R.S. Harwood, R.A. Fuller, W.H. Daffer, B.J. Drouin, R.E. Cofield, D.T. Cuddy, R.F. Jarnot, B.W. Knosp, V.S. Perun, M.J. Schwartz, W.V. Snyder, P.C. Stek, R.P. Thurstans, P.A. Wagner, M. Allaart, S.B. Andersen, G. Bodeker, B. Calpini, H. Claude, G. Coetzee, J. Davies, H. De Backer, H. Dier, M. Fujiwara, B. Johnson, H. Kelder, N. P. Leme, G. König-Langlo, E. Kyrö, G. Laneve, L.S. Fook, J. Merrill, G. Morris, M. Newchurch, S. Oltmans, M.C. Parrondos, F. Posny, F. Schmidlin, P. Skrivankova, R. Stubi, D.J. Tarasick, A. Thompson, V. Thouret, P. Viatte, H. Vömel, P. von Der Gathen, M. Yela, and G. Zablocki. 2007. "Validation of aura microwave limb sounder ozone by ozonesonde and lidar measurements." *Journal of Geophysical Research* 112(24): D24S34. doi:10.1029/2007JD008776.
65. Schoeberl, M.R., J.R. Ziemke, B. Bojkov, N. Livesey, B. Duncan, S. Strahan, L. Froidevaux, S. Kulawik, P.K. Bhartia, S. Chandra, P.F. Levelt, J.C. Witte, A.M. Thompson, E. Cuevas, A. Redondas, D.W. Tarasick, J. Davies, G. Bodeker, G. Hansen, B.J. Johnson, S.J. Oltmans, H. Vömel, M. Allaart, H. Kelder, M. Newchurch, S. Godin-Beekmann, G. Ancellet, H. Claude, S. B. Andersen, E. Kyrö, M. Parrondos, M. Yela, G. Zablocki, D. Moore, H. Dier, P. von der Gathen, P. Viatte, R. Stübi, B. Calpini, P. Skrivankova, V. Dorokhov, H. de Backer, F.J. Schmidlin, G. Coetzee, M. Fujiwara, V. Thouret, F. Posny, G. Morris, J. Merrill, C.P. Leong, G. Koenig-Langlo, and E. Joseph. 2007. "A trajectory-based estimate of the tropospheric column ozone column using the residual method." *Journal of Geophysical Research* 112(24): D24S49. doi: 10.1029/2007JB008773.
64. Yang, Q., D.M. Cunnold, H.-J. Wang, L. Froidevaux, H. Claude, J. Merrill, M.J. Newchurch, S.J. Oltmans. 2007. "Midlatitude tropospheric ozone columns derived from the Aura Ozone Monitoring Instrument and Microwave Limb Sounder measurements." *Journal of Geophysical Research* 112: D20305. doi:10.1029/2007JD008528.
63. Tarasick, D.W., M.D. Moran, A.M. Thompson, T. Carey-Smith, Y. Rochon, V.S. Bouchet, W. Gong, P.A. Makar, C. Stroud, S. Ménard, L.-P. Crevier, S. Cousineau, J.A. Pudykiewicz, A. Kallaur, R. Moffet, R. Ménard, A. Robichaud, O.R. Cooper, S.J. Oltmans, J.C. Witte, G. Forbes, B.J. Johnson, J. Merrill, J.L. Moody, G. Morris, M.J. Newchurch, F.J. Schmidlin, and E. Joseph. 2007. "Comparison of Canadian air quality forecast models with tropospheric ozone profile measurements above midlatitude North America during the IONS/ICARTT campaign: Evidence for stratospheric input." *Journal of Geophysical Research* 112(12): D12S22. doi:10.1029/2006JD007782.
62. Yang, E.-S., D.M. Cunnold, R.J. Salawitch, M.P. McCormick, J. Russell III, J.M. Zawodny, S. Oltmans, and M.J. Newchurch. 2006. "Attribution of recovery in lower-stratospheric ozone." *Journal of Geophysical Research* 111(17): D17309. doi:10.1029/2005JD006371.
61. Liu X., K. Chance, C.E. Sioris, T.P. Kurosu, R.J.D. Spurr, R.V. Martin, T.-M. Fu, J.A. Logan, D.J. Jacob, P.I. Palmer, M.J. Newchurch, I.A. Megretskaia, and R.B. Chatfield. 2006. "First directly retrieved global distribution of tropospheric column ozone from GOME: Comparison with the GEOS-CHEM model." *Journal of Geophysical Research* 111(2): D02308. doi:10.1029/2005JD006564.
60. Liu X., K. Chance, C.E. Sioris, T.P. Kurosu, R.J.D. Spurr, R.V. Martin, T.-M. Fu, J.A. Logan, D.J. Jacob, P.I. Palmer, M.J. Newchurch, I.A. Megretskaia, and R.B. Chatfield. 2006. "Correction to "First directly retrieved global distribution of tropospheric column ozone from GOME: Comparison with the GEOS-CHEM model." *Journal of Geophysical Research* 111(10): D10399. doi:10.1029/2006JD007374.
59. Liu X., K. Chance, C.E. Sioris, T.P. Kurosu, and M.J. Newchurch. 2006. "Intercomparison of GOME, ozonesonde, and SAGE II measurements of ozone: Demonstration of the need to homogenize available ozonesonde data sets." *Journal of Geophysical Research* 111(14): D14305. doi:10.1029/2005JD006718.
58. Cooper O.R., A. Stohl, M. Trainer, A.M. Thompson, J.C. Witte, S.J. Oltmans, G. Morris, K.E. Pickering, J.H. Crawford, G. Chen, R.C. Cohen, T.H. Bertram, P. Wooldridge, A. Perring, W.H. Brune, J. Merrill, J. Moody, D. Tarasick, P. Nédélec, G. Forbes, M.J. Newchurch, F.J. Schmidlin, B.J. Johnson, S. Turquety, S.L. Baughcum, X. Ren, F.J. Fehsenfeld, J.F. Meagher, N. Spichtinger,

- C.C. Brown, S.A. McKeen, I.S. McDermid, and T. Leblanc. 2006. "Large upper tropospheric ozone enhancements above midlatitude North America during summer: In situ evidence from the IONS and MOZAIC ozone measurement network." *Journal of Geophysical Research* 111(24): D24S05. doi:10.1029/2006JD007306.
57. Liu, X., K. Chance, C.E. Sioris, M.J. Newchurch, and T.P. Kurosu. 2006. "A new retrieval for tropospheric ozone profiles from a ground-based ultraviolet spectrometer." *Applied Optics* 45(10): 2352-2359.
56. Kim, J.H., S. Na, M.J. Newchurch, and R.V. Martin. 2005. "Tropical tropospheric ozone morphology and seasonality seen in satellite and in situ measurements and model calculations." *Journal of Geophysical Research* 110(2). doi:10.1029/2003JD004332.
55. Liu, X., K. Chance, C.E. Sioris, R.J.D. Spurr, T.P. Kurosu, R.V. Martin, and M.J. Newchurch. 2005. "Ozone profile and tropospheric retrievals from Global Ozone Monitoring Experiment: Algorithm description and validation." *Journal of Geophysical Research* 110(20). doi:1029/2005JD006240.
54. Polyakov, A.V., Y.M. Timofeyev, D.V. Ionov, Y.A. Virolainen, H.M. Steele, and M.J. Newchurch. 2005. "Retrieval of ozone and nitrogen dioxide concentrations from Stratospheric Aerosol and Gas Experiment III (SAGE III) measurements using a new algorithm." *Journal of Geophysical Research* 100(6): D06303. doi:10.1029/2004JD005060.
53. Virolainen, Y.A., Y.M. Timofeyev, A.V. Polyakov, H. Steele, K. Drdla, and M.J. Newchurch. 2005. "Simulation of polar stratospheric clouds: 1. Microphysical characteristics." *Atmospheric Oceanic Optics* 18(3).
52. Virolainen, Y.A., Y.M. Timofeyev, A.V. Polyakov, H. Steele, K. Drdla, and M.J. Newchurch. 2005. "Simulation of polar stratospheric clouds: 2. Spectral aerosol extinction coefficient and PSC remote sensing possibilities." *Atmospheric Oceanic Optics* 18(3).
51. Liu, X., C.E. Sioris, K. Chance, T.P. Kurosu, M.J. Newchurch, R.V. Martin, and P.I. Palmer. 2005. "Mapping tropospheric ozone profiles from an airborne ultraviolet-visible spectrometer." *Journal of Applied Optics* 44(16). doi:10.1364/AO.44.003312.
50. Yang, E.S., D.M. Cunnold, M.J. Newchurch, and R.J. Salawitch. 2005. "Change in ozone trends at southern high latitudes." *Geophysical Research Letters* 32: 1-5. doi:10.1029/2004GL022296.
49. Cooper, O.R., S. Eckhardt, D.D. Parish, S.J. Oltmans, B.J. Johnson, P. Nédélec, F.J. Schmidlin, M.J. Newchurch, Y. Kondo, and K. Kita. 2005. "A springtime comparison of tropospheric ozone and transport pathways on the east and west coasts of the United States." *Journal of Geophysical Research* 110: D05S90. doi:10.1029/2004JD005183.
48. Cunnold, D.M., E.-S. Yang, M.J. Newchurch, G.C. Reinsel, J.M. Zawodny, and J.M. Russell III. 2004. "Comment on "Enhanced upper stratospheric ozone: Sign of recovery or solar cycle effect?" by W. Steinbrecht et al." *Journal of Geophysical Research* 109: D14305. doi:10.1029/2004JD004826.
47. Kim, J.H., S. Na, M.J. Newchurch, and K.J. Ha. 2004. "Comparison of scan-angle method and convective cloud differential method in retrieving tropospheric ozone from TOMS." *Environmental Monitoring and Assessment* 92: 25-33.
46. Liu, X., M.J. Newchurch, R. Loughman, and P.K. Bhartia. 2004. "Errors resulting from assuming opaque Lambertian cloud surfaces in TOMS ozone retrieval." *Journal of Quantitative Spectroscopy and Radiative Transfer* 85(3-4): 337-365. doi:10.1016/S0022-4073(03)00231-0.
45. Liu X., M.J. Newchurch, and J.H. Kim. 2003. "Occurrence of ozone anomalies over cloudy areas in TOMS data." *Atmospheric Chemistry and Physics* 3: 1113-1129.
44. Newchurch, M.J., D. Sun, J.H. Kim, and X. Liu. 2003. "Tropical tropospheric ozone derived using clear-cloudy pairs (CCP) of TOMS measurements." *Atmospheric Chemistry and Physics* 3: 683-695.
43. Newchurch M.J., E.-S. Yang, D.M. Cunnold, G.C. Reinsel, J.M. Zawodny, and J.M. Russell III. 2003. "Evidence for slowdown in stratospheric ozone loss: First stage of ozone recovery." *Journal of Geophysical Research* 108(D16): 4507. doi:10.1029/2003JD003471.
42. Newchurch, M.J., M.A. Ayoub, S. Oltmans, B. Johnson, and F.J. Schmidlin. 2003. "Vertical distribution of tropospheric ozone at four sites in the United States." *Journal of Geophysical Research* 108(D1): 4031. doi:1029/2002JD001059.
41. Fetzer, E., L.M. McMillin, D. Tobin, H.H. Aumann, M.R. Gunson, W.W. McMillan, D.E. Hagan, M.D. Hofstadter, J. Yoe, D.N. Whiteman, J.E. Barnes, R. Bennartz, H. Vomel, V. Walden, M.J. Newchurch, P.J. Minnett, R. Atlas, F. Schmidlin, E.T. Olsen, M.D. Goldberg, S. Zhou, H. Ding, W.

- L. Smith, and H. Revercomb. 2003. "AIRS/AMSU/HSB validation." *IEEE Transactions on Geoscience and Remote Sensing* 41(2):418 – 431. doi:10.1109/TGRS.2002.808293.
40. Timofeyev, Y.M., A.V. Polyakov, H.M. Steele, and M.J. Newchurch. 2003. "Optimal eigenanalysis for the treatment of aerosols in the retrieval of atmospheric composition from transmission measurements." *Journal of Applied Optics* 42(15): 2635-2646.
39. Irion, F.W., M.R. Gunson, G.C. Toon, A.Y. Chang, A. Eldering, E. Mahieu, G.L. Manney, H.A. Michelsen, E.J. Moyer, M.J. Newchurch, G.B. Osterman, C.P. Rinsland, R.J. Salawitch, B. Sen, Y. L. Yung, R. Zander. 2002. "The Atmospheric Trace Molecule Spectroscopy Experiment (ATMOS) Version 3 data retrievals." *Applied Optics* 41: 6968-6979.
38. Li, J., D.M. Cunnold, H.-J. Wang, E.-S. Yang, and M.J. Newchurch. 2002. "A discussion of upper stratospheric ozone asymmetries and SAGE trends." *Journal of Geophysical Research* 107(D23): 4705. doi:10.1029/2001JD001398.
37. Michelsen, H.A., G.L. Manney, F.W. Irion, G.C. Toon, M.R. Gunson, C.P. Rinsland, R. Zander, E. Mahieu, M.J. Newchurch, P.N. Purcell, E.E. Remsberg, J. M. Russell III, H.C. Pumphrey, J.W. Walters, R.M. Bevilacqua, K.K. Kelly, E.J. Hintsa, E.M. Weinstock, E.-W. Chiou, W.P. Chu, M.P. McCormick, and C.R. Webster. 2002. "ATMOS version 3 water vapor measurements: Comparisons with observations from two ER-2 Lyman- α hygrometers, MkIV, HALOE, SAGE II, MAS, and MLS." *Journal of Geophysical Research* 107(D3). doi:10.1029/2001JD000587.
36. Hauglustaine, D., L. Emmons, M.J. Newchurch, G. Brasseur, T. Takao, K. Matsubara, J. Johnson, B. Ridley, J. Stith, and J. Dye. 2001. "On the role of lightning NO_x in the formation of tropospheric ozone plumes: A global model perspective." *Journal of Atmospheric Chemistry* 38: 277-294. doi: 10.1023/A:1006452309388
35. Kim, J.H., M.J. Newchurch, and K. Han. 2001. "Distribution of Tropical Tropospheric Ozone Determined by the Scan-Angle Method Applied to TOMS Measurement" *Journal of Atmospheric Science* 58: 2699-2708.
34. Newchurch, M.J., X. Liu, and J.H. Kim. 2001. "Lower-tropospheric ozone (LTO) derived from TOMS near mountainous regions." *Journal of Geophysical Research* 106(D17): 403-412. doi:10.1029/2000JD000162.
33. Newchurch, M.J., X. Liu, J.H. Kim, and P.K. Bhartia. 2001. "On the accuracy of TOMS retrievals over cloudy regions." *Journal of Geophysical Research* 106(D23): 315-326. doi:10.1029/2000JD000151.
32. Newchurch, M.J., D. Sun, and J.H. Kim. 2001. "Zonal wave-1 structure in TOMS tropical stratospheric ozone." *Geophysical Research Letters* 28(16): 3151-3154. doi:10.1029/2000GL012315.
31. Cunnold, D.M., M.J. Newchurch, L.E. Flynn, H.J. Wang, J.M. Russell, R. McPeters, J.M. Zawodny, and L. Froidevaux. 2000. "Uncertainties in upper stratospheric ozone trends from 1979 to 1996." *Journal of Geophysical Research* 105(D4): 4427-4444. doi:10.1029/1999JD900313.
30. Newchurch, M.J., L. Bishop, D.M. Cunnold, L.E. Flynn, S. Godin, S.H. Frith, L. Hood, A.J. Miller, S. Oltmans, W. Randel, G. Reinsel, R. Stolarski, R. Wang, E.-S. Yang, and J.M. Zawodny. 2000. "Upper-stratospheric ozone trends 1979-1998." *Journal of Geophysical Research* 105(D11). doi:10.1029/2000JD900037.
29. McPeters, R.D., D.J. Hofmann, M. Clark, L. Flynn, L. Froidevaux, M. Gross, B. Johnson, G. Koenig, X. Liu, S. McDermid, T. McGee, F. Murcray, M.J. Newchurch, S. Oltmans, A. Parrish, R. Schnell, U. Singh, J.J. Tsou, T. Walsh, and J.M. Zawodny. 1999. "Results from the 1995 stratospheric ozone profile intercomparison at Mauna Loa." *Journal of Geophysical Research* 104(D23). doi:10.1029/1999JD900760.
28. Randel, W.J., R.S. Stolarski, D.M. Cunnold, J.A. Logan, M.J. Newchurch, and J.M. Zawodny. 1999. "Trends in the vertical distribution of ozone" *Science* 285: 1689 -1692.
27. Rinsland, C.P., R.J. Salawitch, M.R. Gunson, S. Solomon, R. Zander, E. Mahieu, A. Goldman, M.J. Newchurch, F.W. Irion, and A.Y. Chang. 1999. "Polar stratospheric descent of NO_y and CO and Arctic denitrification during winter 1992-93." *Journal of Geophysical Research* 104(D1): 1847-1861. doi:10.1029/1998JD100034.
26. Kim, J.H., and M.J. Newchurch. 1998. "Biomass-burning influence on tropospheric ozone over New Guinea and South America, 1455-1461." *Journal of Geophysical Research* 103(D1). doi:10.1029/97JD02294.

25. Newchurch, M.J., D.M. Cunnold, and J. Cao. 1998. "Intercomparison of SAGE with Umkehr[64] and Umkehr[92] ozone profiles and time series: 1979-1991." *Journal of Geophysical Research* 103(D23): 31,277-31,292. doi:10.1029/98JD02400.
24. Rinsland, C.P., M.R. Gunson, P. Wang, R.F. Arduini, B.A. Baum, P. Minnis, A. Goldman, M.C. Abrams, R. Zander, E. Mahieu, R.J. Salawitch, H.A. Michelsen, F.W. Irion, and M.J. Newchurch. 1998. "ATMOS/ATLAS 3 infrared profile measurements of clouds in the tropical and subtropical upper troposphere." *Journal of Quantitative Spectroscopy and Radiative Transfer* 60(5), 903-919.
23. Rinsland, C.P., M. Gunson, P. Wang, R.F. Arduini, B.A. Baum, P. Minnis, A. Goldman, M.C. Abrams, R. Zander, E. Mahieu, R.J. Salawitch, H.A. Michelsen, F.W. Irion, and M.J. Newchurch. 1998. "ATMOS/ATLAS 3 infrared profile measurements of trace gases in the November 1994 tropical and subtropical upper troposphere" *Journal of Quantitative Spectroscopy and Radiative Transfer* 60(5): 891-901.
22. Lary, D.J., R. Toumi, A.M. Lee, M.J. Newchurch, M. Pirre, and J.B. Renard. 1997. "Carbon aerosols and atmospheric photochemistry." *Journal of Geophysical Research* 102(D3): 3671-3682.
21. Abbas, M.M., H.A. Michelsen, M.R. Gunson, M.C. Abrams, M.J. Newchurch, R.J. Salawitch, A.Y. Chang, A. Goldman, F.W. Irion, G.L. Manney, E.J. Moyer, R. Nagaraju, C.P. Rinsland, G.P. Stiller, and R. Zander. 1996. "Seasonal variations of water vapor in the lower stratosphere inferred from ATMOS/ATLAS-3 measurements of H₂O and CH₄." *Geophysical Research Letters* 23(17): 2401-2404. doi:10.1029/96GL01321.
20. Abbas M. M., M. R. Gunson, M. J. Newchurch, H. A. Michelsen, R. J. Salawitch, M. Allen, M. C. Abrams, A. Y. Chang, A. Goldman, F. W. Irion, E. J. Moyer, R. Nagaraju, C. P. Rinsland, G. P. Stiller, R. Zander (1996), The hydrogen budget of the stratosphere inferred from ATMOS measurements of H₂O and CH₄, *Geophysical Research Letters*, 23(17), 2405-2408, 10.1029/96GL01320.
19. Abrams, M.C., A.Y. Chang, M.R. Gunson, M.M. Abbas, A. Goldman, F.W. Irion, H.A. Michelsen, M.J. Newchurch, C.P. Rinsland, G.P. Stiller, and R. Zander. 1996. "On the assessment and uncertainty of atmospheric trace gas burden measurements with high resolution infrared solar occultation spectra from space by the ATMOS experiment." *Geophysical Research Letters* 23(17): 2337-2340. doi:10.1029/96GL01794.
18. Abrams, M.C., G.L. Manney, M.R. Gunson, M.M. Abbas, A.Y. Chang, A. Goldman, F.W. Irion, H.A. Michelsen, M.J. Newchurch, C.P. Rinsland, R.J. Salawitch, G.P. Stiller, and R. Zander. 1996. "ATMOS/ATLAS-3 observations of long-lived tracers and descent in the Antarctic vortex in November 1994." *Geophysical Research Letters* 23(17): 2341-2344. doi:10.1029/96GL00705.
17. Abrams, M.C., G.L. Manney, M.R. Gunson, M.M. Abbas, A.Y. Chang, A. Goldman, F.W. Irion, H.A. Michelsen, M.J. Newchurch, C.P. Rinsland, R. J. Salawitch, G.P. Stiller, and R. Zander. 1996. "Trace gas transport in the Arctic vortex inferred from ATMOS ATLAS-2 observations during April 1993." *Geophysical Research Letters* 23(17): 2345-2348. doi:10.1029/96GL00704.
16. Chang, A. Y., R.J. Salawitch, H.A. Michelsen, M.R. Gunson, M.C. Abrams, R. Zander, C.P. Rinsland, J.W. Elkins, G.S. Dutton, C.M. Volk, C.R. Webster, R.D. May, D.W. Fahey, R.-S. Gao, M. Lowenstein, J.R. Podolske, R.M. Stimpfle, D.W. Kohn, M.H. Proffitt, J.J. Margitan, K.R. Chan, M.M. Abbas, A. Goldman, F.W. Irion, G.L. Manney, M.J. Newchurch, and G.P. Stiller. 1996. "A comparison of measurements from ATMOS and instruments aboard the ER-2 aircraft: Halogenated gases." *Geophysical Research Letters* 23(17): 2393-2396. doi:10.1029/96GL01678.
15. Chang, A.Y., R.J. Salawitch, H.A. Michelsen, M.R. Gunson, M.C. Abrams, R. Zander, C.P. Rinsland, J.W. Elkins, G.S. Dutton, C.M. Volk, C.R. Webster, R.D. May, D.W. Fahey, R.-S. Gao, M. Lowenstein, J.R. Podolske, R.M. Stimpfle, D.W. Kohn, M.H. Proffitt, J.J. Margitan, K.R. Chan, M.M. Abbas, A. Goldman, F.W. Irion, G.L. Manney, M.J. Newchurch, and G.P. Stiller. 1996. "A comparison of measurements from ATMOS and instruments aboard the ER-2 aircraft: Halogenated gases." *Geophysical Research Letters* 23(17): 2393-2396. doi:10.1029/96GL01678.
14. Gunson, M.R., M.M. Abbas, M.C. Abrams, M. Allen, L.R. Brown, T.L. Brown, A.Y. Chang, A. Goldman, F.W. Irion, L.L. Lowes, E. Mahieu, G.L. Manney, H.A. Michelsen, M.J. Newchurch, C.P. Rinsland, R.J. Salawitch, G.P. Stiller, G.C. Toon, Y.L. Yung, and R. Zander. 1996. "The Atmospheric Trace Molecule Spectroscopy (ATMOS) experiment: Deployment on the ATLAS space shuttle missions." *Geophysical Research Letters* 23(17): 2333-2336. doi:10.1029/96GL01569.
13. Irion, F.W., E.J. Moyer, M.R. Gunson, C.P. Rinsland, Y.L. Yung, H.A. Michelsen, R.J. Salawitch, A.Y. Chang, M.J. Newchurch, M.M. Abbas, M.C. Abrams, and R. Zander. 1996. "Stratospheric

- observations of CH₃D and HDO from ATMOS infrared solar spectra: Enrichments of deuterium in methane and implications for HD." *Geophysical Research Letters* 23(17): 2381-2384. doi:10.1029/96GL01402.
12. Kim, J.H., M.J. Newchurch. 1996. "Climatology and trends of tropospheric ozone over the eastern Pacific Ocean: The influence of biomass burning and tropospheric dynamics." *Geophysical Research Letters* 23(25): 3723-3726. doi:10.1029/96GL03615.
 11. Kriebel, D.L., R.M. Bevilacqua, E. Hilsenrath, M. Gunson, G.K. Hartmann, M. Abrams, M. Daehler, T. A. Pauls, M.J. Newchurch, C.P. Aellig, and M.C. Bories. 1996. "A comparison of ozone measurements made by the ATMOS, MAS, and SSBUV instruments during ATLAS 1, 2, and 3." *Geophysical Research Letters* 23(17): 2301-2304. doi:10.1029/96GL01024.
 10. Michelsen, H.A., R.J. Salawitch, M.R. Gunson, C. Aellig, N. Kaempfer, M.M. Abbas, M.C. Abrams, T.L. Brown, A.Y. Chang, A. Goldman, F.W. Irion, M.J. Newchurch, C.P. Rinsland, G.P. Stiller, and R. Zander. 1996. "Stratospheric chlorine partitioning: Constraints from shuttle-borne measurements of [HCl], [ClNO₃], and [ClO]." *Geophysical Research Letters* 23(17): 2361-2364. doi:10.1029/96GL00787.
 9. Newchurch, M.J., M. Allen, M.R. Gunson, R.J. Salawitch, G.B. Collins, K.H. Huston, M.M. Abbas, M.C. Abrams, A.Y. Chang, D.W. Fahey, R.S. Gao, F.W. Irion, M. Lowenstein, G.L. Manney, H.A. Michelsen, J.R. Podolske, C.P. Rinsland, and R. Zander. 1996. "Stratospheric NO and NO₂ abundances from ATMOS solar-occultation measurements." *Geophysical Research Letters* 23(17): 2373-2376. doi:10.1029/96GL01196.
 8. Rinsland, C.P., M.R. Gunson, R.J. Salawitch, H.A. Michelsen, R. Zander, M.J. Newchurch, M.M. Abbas, M.C. Abrams, G.L. Manney, A.Y. Chang, F.W. Irion, A. Goldman, and E. Mahieu. 1996. "ATMOS/ATLAS-3 measurements of stratospheric chlorine and reactive nitrogen partitioning inside and outside the November 1994 Antarctic Vortex." *Geophysical Research Letters* 23(17): 2365-2368. doi:10.1029/96GL01474.
 7. Rinsland, C.P., M.R. Gunson, R.J. Salawitch, M.J. Newchurch, R. Zander, M.M. Abbas, M.C. Abrams, G.L. Manney, H.A. Michelsen, A.Y. Chang, and A. Goldman. 1996. "ATMOS Measurements of H₂O+2CH₄ and total reactive nitrogen in the November 1994 Antarctic stratosphere: Dehydration and denitrification in the vortex." *Geophysical Research Letters* 23(17): 2397-2400. doi:10.1029/96GL00048.
 6. Rinsland, C.P., E. Mahieu, R. Zander, M.R. Gunson, R.J. Salawitch, A.Y. Chang, A. Goldman, M.C. Abrams, M.M. Abbas, M.J. Newchurch, and F.W. Irion. 1996. "Trends of OCS, HCN, SF₆, CHClF₂, (HCFC-22) in the lower stratosphere from 1985 and 1994 Atmospheric Trace Molecule Spectroscopy experiment measurements near 30° N latitude." *Geophysical Research Letters* 23(17): 2349-2352. doi:10.1029/96GL01234.
 5. Zander, R., E. Mahieu, M.R. Gunson, M.C. Abrams, A.Y. Chang, M. Abbas, C. Aellig, A. Engel, A. Goldman, F.W. Irion, N. Kampfer, H.A. Michelsen, M.J. Newchurch, C.P. Rinsland, R.J. Salawitch, G.P. Stiller, and G.C. Toon. 1996. "The 1994 northern midlatitude budget of stratospheric chlorine derived from ATMOS/ATLAS-3 observations." *Geophysical Research Letters* 23(17): 2357-2360. doi:10.1029/96GL01792.
 4. Zander, R., S. Solomon, E. Mahieu, A. Goldman, C.P. Rinsland, M.R. Gunson, M.C. Abrams, A.Y. Chang, R.J. Salawitch, H.A. Michelsen, M.J. Newchurch, and G.P. Stiller. 1996. "Increase of stratospheric carbon tetrafluoride (CF₄) based on ATMOS observations from space." *Geophysical Research Letters* 23(17): 2353-2356. doi:10.1029/96GL00957.
 3. Newchurch, M.J., D.M. Cunnold, and H.J. Wang (1995), SAGE II-Umkehr ozone profile comparisons, *Journal of Geophysical Research* 100(D7): 14,029-14,042. doi:10.1029/95JD01046.
 2. Newchurch, M.J. and D.M. Cunnold. 1994. "Aerosol effect on umkehr ozone profiles using Stratospheric Aerosol and Gas Experiment II measurements." *Journal of Geophysical Research* 99:1383-1388.
 1. Newchurch, M.J., G.W. Grams, D.M. Cunnold, and J.J. DeLuisi. 1987. "A comparison of SAGE I, SBUV, and Umkehr ozone profiles including a search for Umkehr aerosol effects." *Journal of Geophysical Research* 92: 8382-8390.

REPORTS

1. WMO Assessment of trends in the vertical distribution of ozone, *Stratospheric Processes and their Role in Climate (SPARC) Report No. 1*, World Meteorological Organization Global Ozone Research Monitoring Project Report No. 43, Geneva, 1998.

NON-REFERRED PUBLICATIONS, CONFERENCE PAPERS, PRESENTATIONS

230. M. J. Newchurch, R. J. Alvarez II, T. A. Berkoff, W. Carrion, R. J. DeYoung, R. Ganoë, G. Gronoff, G. Kirgis, S. Kuang, A. O. Langford, T. Leblanc, T. J. McGee, D. Pliutau, C. Senff, J. T. Sullivan, G. Sumnicht, L. W. Twigg, L. Wang (2018), TOLNet Ozone Lidar Intercomparison during the Discover-AQ and Frappé Campaigns, The 28th International Laser Radar Conference (ILRC 28) Volume 176, <https://doi.org/10.1051/epjconf/201817610007>.
229. Newchurch, M., K. Chance, B. L. Lefer (2018), Integrating Ground-Based In-Situ and Ozone Lidar Network Measurements with Future Geostationary Satellite Observations to Maximizing Data Utility and Societal Benefits American Geophysical Union, Fall Meeting 2018, abstract #A53G-2562.
228. Kuang, S., Newchurch, M., Wang, B., Tucker, P. R. (2018), Horizontal Lidar Measurements of Near-Surface Ozone American Geophysical Union, Fall Meeting 2018, abstract #A311-2973.
227. Newchurch, M.J. Session Lead: New Directions for Satellite Data: Applications in Health, Air Quality, Environmental Management, and Public Outreach, AGU Fall Meeting, 10-14 December 2018, Washington DC. [Session Information](#)
226. Kuang, S., M. J. Newchurch, A. Thompson, R. Stauffer, B. Johnson, L. Wang (2018), Ozone Variability and Anomalies Observed during SENEX and SEAC4RS Campaigns, AMS 98th Annual Meeting, 7-11 Jan. 2018, Austin, TX. [Poster.pdf](#)
225. Newchurch, M. J., R. J. Alvarez II, T. A. Berkoff, G. Chen, G. Gronoff, M. Johnson, G. Kirgis, S. Kuang, A. O. Langford, T. Leblanc, B. L. Lefer, T. J. McGee, C. J. Senff, K. Strawbridge, J. T. Sullivan, B. Wang, L. Wang (2017), Tropospheric Ozone Lidar Network (TOLNet) Observations of Processes Controlling Spatio-Temporal Tropospheric Ozone Distributions, AGU Annual Meeting, New Orleans, Dec. 11-15, 2017. [Poster.pdf](#)
224. Wang B., M. J. Newchurch, S. Kuang, L. Wang, A. Kaulfus (2017), Diverse Fire Sources of Smoke-induced Ozone Laminæ in Southeast U.S. Observed by Ozone Lidar and Ozonesonde, AGU Annual Meeting, New Orleans, Dec. 14, 2017. [Poster.pdf](#)
223. Kuang, S., M. J. Newchurch, B. Wang, L. Wang (2017), Recent Ozone Studies at the UAH Station, TOLNet Science Team Meeting, Toronto, Canada, September 19-21, 2017. [Presentation.pdf](#)
222. Newchurch, M. J., M. S. Johnson, G. Huang, S. Kuang, L. Wang, K. Chance, Xiong Liu, B. Wang, A. P. Biazar (2016), Understanding the Laminar Distribution of Tropospheric Ozone from Ground-based, Airborne, Space-borne, and Modeling Perspectives, AGU Fall Meeting, San Francisco, CA, USA, 16 Dec. 2016. [Poster.pptx](#)
221. Newchurch, M. J, K. Chance, B. Zavodsky, J. Haynes, B. Lefer, A. Naeger, and the TEMPO Early Adopters Team (2016), TEMPO Early Adopters in Air-Quality Forecasting, Planning and Assessment, Pollution Emissions, Health, Agriculture, and Environmental Impacts: Applications and Decision Support, AGU Fall Meeting, San Francisco, CA, USA, 14 Dec. 2016. [Poster.pptx](#)
220. Kuang, S., M. J. Newchurch, J. Burris, E. Eloranta, M. Johnson, J. Hair, G. Huang, J. Reid, B. Wang, L. Wang (2016), Variability, Source Attribution, and Model Evaluation of Ozone over the Southeastern United States, NDACC Lidar Working Group Meeting, MeteoSwiss, Payerne, Switzerland, June 13, 2016.
219. Newchurch, M. J., Shi Kuang, Thierry Leblanc, Raul J. Alvarez, Andrew O. Langford, Christoph J. Senff, John F. Burris, Thomas J. McGee, John T. Sullivan, Russell J. DeYoung, Jassim Al-Saadi, Matthew Johnson, Alex Pszenny, TOLNET – A Tropospheric Ozone Lidar Profiling Network for Satellite Continuity and Process Studies, EPJ Web of Conferences 119 20001, DOI: 10.1051/epjconf/201611920001.
218. Wilkins, J. L., Morris, G. A., Fishman, J., Foy, B., Graves, C., Newchurch, M., Kuang, S., Hyer, E., Peterson, D., Thompson, A. M. (2015), An Analysis of SEACIONS Ozone St. Louis, MO. Site in

- August-September 2013: Insight into the Influences of Wildfires and Strat-Trop Exchange on Midwest Regional Air Quality, ACAST Meeting, St. Louis, MO, 2-4 June. [Poster.pptx](#)
217. Kuang S., M. J. Newchurch, J. Burris, L. Wang, B. Johnson, P. Cullis, G. Huang, and W. Cantrell (2015), Characteristics of the Vertical Ozone Structures Measured at Huntsville in 2013, AMS meeting. [Poster.pdf](#)
216. Newchurch, M., R. J. Alvarez, A. Brewer, S. S. Brown, W. Carrion, R. Delgado, R. De Young, G. Huang, B. Johnson, S. Kuang, A. O. Langford, J. K. Lundquist, T. J. McGee, D. Pliutau, C. J. Senff, J. T. Sullivan, G. K. Sumnicht, L. Twigg, and L. Wang (2014), Ozone Diurnal Variation in the PBL at the Boulder Atmospheric Observatory During Summer 2014, AGU Fall Meeting. [Poster.pptx](#)
215. Newchurch, M., L. Wang, A. Langford, C. Senff, T. McGee, J. Sullivan, R. De Young, S. Brown, B. Johnson, and S. Kuang (2015), TOLNet Ozone Lidar, ARNOLD/CRD ozone on the carriage, and free/tether ozonesonde, observations at the BAO before DISCOVER-AQ/Colorado, Joint FRAPP/DISCOVER-AQ Science Team Meeting. [Poster.pptx](#)
214. Kuang, S., M. Newchurch, J. Burris, L. Wang, B. Wang, G. Huang, P. Cullis, B. Johnson, and E. Eloranta (2015), Recent Atm Chem studies using Huntsville ozone observations, TOLNet Working Group Meeting, June 2015. [Presentation.pdf](#)
213. Kuang, S., M. Newchurch, J. Burris, C. Craft, D. Bowdle, L. Wang, G. Huang, and B. Wang (2015), TOLNet/UAH station report - operation, upgrade, and future plan, TOLNet Working Group Meeting, June 2015. [Poster.pptx](#)
212. Newchurch, M. (2015), Tropospheric Emissions: Monitoring of Pollution TEMPO, SPoRT Briefing. October 2014. [Poster.pdf](#)
211. Newchurch, M. (2015), TOLNet Overview and Charge to the Group, 2nd annual TOLNet Science Team meeting, June 15-18, 2015, NOAA/ESRL/CSD Boulder, CO. [Poster.pptx](#)
210. Newchurch, M., et al. (2015), TEMPO Validation Activities: Context, Methods, and Tools, 3rd TEMPO Science Team Meeting, May 2015. Huntsville, Alabama. [Poster.pptx](#)
209. Newchurch, M., et al. (2015), TEMPO Validation Activities: Ozone Validation Plan, 3rd TEMPO Science Team Meeting, May 2015. Huntsville, Alabama. [Poster.pptx](#)
208. Newchurch, M., Shi Kuang, Thierry Leblanc, Raul J. Alvarez II, Andrew O. Langford, Christoph J. Senff, Steve Brown, Bryan Johnson, John F. Burris, Thomas J. McGee, John T. Sullivan, Russell J. DeYoung, Jassim Al-Saadi, Matthew Johnson, Alex Pszenny, Brad Pierce (2015), TOLNet- A tropospheric Ozone Lidar Profiling Network for Satellite Continuity and Process Studies, ILRC, 5-10 July 2015, New York City, New York. [Poster.pptx](#)
207. Newchurch, M. (2015), TOLNet lidar accuracy assessment, June 15-18, 2015, NOAA/ESRL/CSD Boulder, CO. [Presentation.pdf](#)
206. Newchurch, M., Shi Kuang, Lihua Wang, Kevin Knupp, Thierry Leblanc, Raul J. Alvarez II, Andrew O. Langford, Christoph J. Senff, Steve Brown, Bryan Johnson, John F. Burris, Thomas J. McGee, John T. Sullivan, Russell J. DeYoung, Jassim Al-Saadi, Johnathan Hair, Gao Chen, Matthew Johnson, Barry Lefer, Brad Pierce, Edwin Eloranta, UAH, Caltech/JPL, NOAA/ESRL, CU, NASA/GSFC, ORAU, NASA/LaRC, NASA/ARC, NASA/HD, UW (2015), TOLNet- A tropospheric Ozone Lidar Profiling Network for Satellite Validation and Process Studies, IWAQFR, 1-3 September 2015, College Park, MD [Poster.pptx](#)
205. Lihua Wang, Mike Newchurch, Shi Kuang, John F. Burris, Guanyu Huang, Arastoo Pour-Biazar, William Koshak, Melanie B. Follette-Cook, Kenneth E. Pickering, Thomas J. McGee, John T. Sullivan, Andrew O. Langford, Christoph J. Senff, Raul Alvarez, Edwin Eloranta, Alan Brewer, UAH, NASA/GSFC, Harvard-SAO, NASA/MSFC, Morgan State University, NOAA/ESRL, UW-Madison, ORAU, CU- Boulder (2015), IWAQFR, 1-3 September 2015, College Park, MD [Poster.pptx](#)
204. Johnson, M.S., S. Kuang, L. Wang, M.J. Newchurch, J. W. Hair, Analysis of Summertime Ozone and Precursor Species in Southeast United States, AGU Fall Meeting, San Francisco, CA, 14 December, 2016. [\..\.Meetings\2015.12 AGU\Johnson AGU 2015 Poster.pdf](#)
203. Newchurch, M. J., Chemical Weather R2O in SPoRT with Tropospheric Emissions: Monitoring of Pollution (TEMPO), SPoRT VCL, NSSTC, Huntsville AL 23 April 2015.
202. Follette-Cook, Melanie, Pickering, K., Wang, L., Newchurch, M. J., Natraj, V., Kulawik, S., (2013), Ability of GEO-CAPE to Detect Lightning NOx and Resulting Upper Tropospheric Ozone

- Enchancement, GEO-CAPE Open Community Workshop, 21-14 May, NASA Ames Research Center [Poster.pptx](#)
201. Huang, G., M. J. Newchurch, S. Kuang, L. Wang, W. Cantrell (2013), Ozone Entrainment Flux using Ozone DIAL and Compact Wind Aerosol Lidar (CWAL) in Huntsville AL, AGU Fall Meeting, San Francisco, CA, 9-13 December [Poster.pptx](#)
 200. Kuang, S., Newchurch, M. J., Burris, J., Cantrell, W., Huang, G., Pospelov, N., Wang, L., Koshak, B., Peterson, H., Knupp, K., Pour-Biazar, A.,(2013), Tropospheric Ozone Lidar Network (TOLNet) Observations and Applications, NSSTC Seminar, 25 Sept., National Space Science and Technology Center (UAH) [Presentation.pptx](#)
 199. Kuang, S., M. J. Newchurch, J. Burris, W. Cantrell, P. Cullis, E. Eloranta, G. Huang, B. Johnson, K. Knupp, L. Wang (2013), Ozone observations at Huntsville during the 2013 SENEX and SEAC4RS campaigns, AGU Fall Meeting, San Francisco, CA, 9-13 December [Poster.pdf](#)
 198. Kuang, S., Newchurch, M. J., Burris, J., Cantrell, W.,(2013), UAH Ground-based Ozone Lidar - A New NDACC Lidar Station Member, NDACC Lidar Working Group Meeting, 4 Nov., NASA/JPL, Table Mountain, CA [Presentation.pptx](#)
 197. Kuang, S., Newchurch, M. J., Burris, J., Cantrell, W., Wang, L., Huang, G., Eloranta, E.,(2013), Tropospheric Ozone Observations at UAH, NDACC Lidar Working Group Meeting, 5 Nov., NASA/JPL, Table Mountain, CA [Presentation.pptx](#)
 196. Newchurch, M. J., Burris, J., Cantrell, W., Kuang, S.,(2013), NDACC Huntsville Station Operation, NDACC Lidar Working Group Meeting, 4 Nov., NASA/JPL, Table Mountain, CA [Presentation.pptx](#)
 195. Mike Newchurch, Raul Alvarez, Jay Al-Saadi, John Burris, Wesley Cantrell, Gao Chen, Russell DeYoung, Mike Hardesty, Ray Hoff, Guanyu Huang, Jack Kaye, Kevin Knupp, Alex Pszenny, Shi Kuang, Andy Langford, Thierry Leblanc, Stuart McDermid, Tom McGee, Brad Pierce, Christoph Senff, John Sullivan, Jim Szykman, Gail Tonnesen, and Lihua Wang ,(2013), Tropospheric Ozone Lidar Network (TOLNet)- Long-term Tropospheric Ozone Profiling for Satellites, Modeling, and Chemistry Studies, NDACC Lidar Working Group Meeting, 7 Nov., NASA/JPL, Table Mountain,CA [Presentation.pptx](#)
 194. Mike Newchurch, Jassim A. Al-Saadi, Raul J. Alvarez, John Burris, Wesley Cantrell, Gao Chen, Russell DeYoung, R. Michael Hardesty, Jerry Herwehe, Guanyu Huang, Raymond M. Hoff, Jack A. Kaye, Shi Kuang, Kevin Kunpp, Andy Langford, Thierry Leblanc, Stuart McDermid, Thomas J. McGee, R. Bradley Pierce, Christopher J. Senff, John Sullivan, Jim Szykman, Gail Tonnesen, Lihua Wang, (2013), Tropospheric Ozone Lidar Network (TOLNET) Contributions to GEO-CAPE and TEMPO Science, GEO-CAPE Science Team Meeting, 21-14 May, NASA Ames Research Center [Poster.pptx](#)
 193. Newchurch, M. J., Alvarez, R., Al-Saadi, J., Burris, J., Cantrell, W., Chen, G., DeYoung, R., Hardesty, M., Hoff, R., Kaye, J., Knupp, K., Kuang, S., Langford, A., Leblanc, T., McDermid, S., McGee, T., Pierce, B., Senff, C., Sullivan, J., Szykman, T., Tonnesen, G., and Wang, L., (2013), Tropospheric Ozone Lidar Network (TOLNet) - Tropospheric Ozone and Aerosol Profiling for Satellite Continuity and Process Studies, 93rd Annual AMS Meeting, Austin, TX, 6-10 January [Presentation.pdf](#)
 192. Peterson, H. S., S. Kuang, W. J. Koshak, M. J. Newchurch (2013), Correlation of DIAL Ozone Observation with Lightning, AGU Fall Meeting, San Francisco, CA, 9-13 December
 191. Peterson, H., Pour-Biazar, A., Newchurch, M. J., Cantrell, W.(2013), Surface NOx Measurements in Northern Alabama During and After DC3, 93rd Annual AMS Meeting, Austin, TX, 6-10 January [Poster.ppt](#)
 190. Reid, J. S., et al., (2013) Aerosol Optical Thickness Patterns and Their Trend in the Southeastern United States, AGU Fall Meeting, San Francisco, CA, 9-13 December [Presentation.pptx](#)
 189. Wang, L., Newchurch, M. J., Pour-Biazar, A., Kuang, S., Khan, M., Liu, X., Koshak, W., Chance, K.(2013), Estimating the Influence of Lightning on Upper Tropospheric Ozone Using NLDN Lightning Data and CMAQ Model, 93rd Annual AMS Meeting, Austin, TX, 6-10 January [Poster.pdf](#)
 188. Newchurch, M. J., Alvarez, R., Al-Saadi, J., Burris, J., Cantrell, W., Chen, G., DeYoung, R., Hardesty, M., Hoff, R., Kaye, J., Knupp, K., Kuang, S., Langford, A., Leblanc, T., McDermid, S., McGee, T., Pierce, B., Senff, C., Sullivan, J., Szykman, T., Tonnesen, G., and Wang, L., (2013), Tropospheric

- Ozone Lidar Network (TOLNet) - Tropospheric Ozone and Aerosol Profiling for Satellite Continuity and Process Studies, 93rd Annual AMS Meeting, Austin, TX, 6-10 January.
187. Peterson, H., Pour-Biazar, A., Newchurch, M. J., Cantrell, W. (2013), Surface NO_x Measurements in Northern Alabama During and After DC3, 93rd Annual AMS Meeting, Austin, TX, 6-10 January.
 186. Wang, L., Newchurch, M. J., Pour-Biazar, A., Kuang, S., Khan, M., Liu, X., Koshak, W., Chance, K. (2013), Estimating the Influence of Lightning on Upper Tropospheric Ozone Using NLDN Lightning Data and CMAQ Model, 93rd Annual AMS Meeting, Austin, TX, 6-10 January.
 185. Newchurch, Mike, Jassim A. Al-Saadi, Raul J. Alvarez, John Burris, Wesley Cantrell, Gao Chen, Russell DeYoung, R. Michael Hardesty, Raymond M. Hoff, Jack A. Kaye, Shi Kuang, et al. (2012), Tropospheric Ozone Lidar Network (TOLNET) - Long-term Tropospheric Ozone and Aerosol Profiling for Satellite Continuity and Process Studies, AGU Fall Meeting, San Francisco, CA, 3-7 December.
 184. Guanyu Huang, Michael J. Newchurch, Shi Kuang, Lihua Wang, Wesley Cantrell, Bryan Johnson, Patrick Cullis, The Spatial and Temporal Distribution of Tropospheric Ozone Laminae Structures, AGU Fall Meeting, San Francisco, CA, 3-7 December.
 183. Kuang, S., M. J. Newchurch, J. Burris, W. Cantrell, G. Huang (2012), Ozone Lidar Measurements in the Boundary Layer, AGU, San Francisco, 3-7 December.
 182. Peterson, Harold, Arastoo Pour-Biazar, Mike Newchurch, Wesley Cantrell, Lightning NO_x Measurements during and after DC3, GLM Science Meeting, Huntsville, AL, 19 September 2012.
 181. Newchurch, M.J., R. J. Alvarez, J. Al-Saadi, J. Burris, R. DeYoung, J. Hair, M. Hardesty, S. Kuang, A. O. Langford, T. Leblanc, S. McDermid, T. McGee, B. Pierce, C. Senff, J. Szykman (2011), An Interagency Research Initiative for Ground-Based Lidar Profiling of Tropospheric Ozone and Aerosol, AGU, San Francisco, CA, 5 December.
 180. Kuang, S., M. J. Newchurch, J. Burris, K. Knupp, L. Wang (2011), Stratosphere-to-Troposphere Transport Revealed by Ground-based Ozone Lidar, AGU, San Francisco, CA, 5 December.
 179. Newchurch, M. J., J. Al-Saadi, R. J. Alvarez, J. Burris, J. Hair, R. DeYoung, M. Hardesty, S. Kuang, A.O. Langford, S. McDermid, T. McGee, C. Senff, J. Szykman, G. Tonnesen (2011), An Interagency Research Initiative for Ground-Based Lidar Profiling of Tropospheric Ozone and Aerosols, Air Quality Research Subcommittee, Washington, DC, 17 Nov.
 178. Newchurch, M. J., G. Huang, B. Pierce, J. Burris, S. Kuang, W. Cantrell, L. Wang, P. I. Buckley, S. Johnson, K. Knupp, D. Phillips (2011) Tropospheric Ozone Laminae Structures and Vertical Correlation Lengths, NOAA ESRL Global Monitoring Annual Meeting, Boulder, CO, 17-18 May.
 177. Huang, G., M. J. Newchurch, J. Burris, S. Kuang, W. Cantrell, L. Wang, P. Buckley (2011), Tropospheric Ozone Layer Attributes Quantified by Continuous Wavelet Transform (CWT) and Gradient Analysis, NOAA ESRL Global Monitoring Annual Meeting, Boulder, CO, 17-18 May.
 176. Newchurch, M. J., G. Huang, J. Burris, S. Kuang, W. Cantrell, L. Wang, P. I. Buckley, B. Pierce (2011), Spatio-temporal Variability of Ozone Laminae, 2nd GEO-CAPE Community Workshop, Boulder, CO, 11-13 May.
 175. Newchurch, M. J., G. Huang, J. Burris, S. Kuang, W. Cantrell, L. Wang, P. I. Buckley, B. Pierce (2011), Complementary Ground-based and Space-borne Profile Measurements for Air Quality, 1st Workshop Satellite and Above-boundary-layer Observations for Air-Quality Management, Boulder, CO, 9-10 May.
 174. Newchurch, M. J., J. Burris, S. Kuang, A. Pour-Biazar, G. Huang, L. Wang, W. Cantrell, P. I. Buckley, B. Pierce, M. Hardesty, R. J. Alvarez, J. Hair, S. McDermid, T. McGee (2011), Boundary Layer and Free Tropospheric Ozone Spatio-Temporal Variability: UAH Lidar Measurements, NASA Goddard Space Flight Center, Greenbelt, MD, 30 June.
 173. Newchurch, M. J., J. Kim, L. Wang, S. Kuang, J. Burris, T. Kurosu, X. Liu, G. Huang, W. Cantrell, K. Chance, S. Kim, K. Baek, and I. De Smedt (2010), Tropospheric features seen/not seen by Aura, AURA Science Team Meeting, Boulder, CO, 27-29 September.
 172. Kuang, S., L. Wang, E.-S. Yang, M. J. Newchurch, J. Burris, G. Huang, W. Cantrell, P. Buckley, and X. Liu (2010), Lidar, Layers, LNO_x, and Recovery, Institute of Atmospheric Physics, Beijing, China, 30 August.
 171. Kuang, S., M. Newchurch, J. Burris, and Steve Johnson (2010), Differential Absorption Lidar to Measure Tropospheric Ozone Variations, Institute of Atmospheric Physics, Beijing, China, 30 August.

170. Wang, L., M. J. Newchurch, A. Biazar, M. Khan, X. Liu, and Y. Park (2010), Application of OMI Ozone Profiles in CMAQ, Asia Pacific Radiation Symposium (APRS), Seoul, Korea, 25-28 August.
169. Newchurch, M. J., S. Kuang, J. Burris, L. Wang, P. Buckley, W. Cantrell, G. Huang, X. Liu, and D. Hopson (2010), Tropospheric ozone variations revealed by high-resolution lidar, Asia Pacific Radiation Symposium (APRS), Seoul, Korea, 25-28 August.
168. Kuang, S., M. J. Newchurch, and J. Burris (2010), Design of the four-wavelength lidar for ozone measurements from PBL to UTLS, Asia Pacific Radiation Symposium (APRS), Seoul, Korea, 25-28 August.
167. Al-Saadi, J., M. Chin, S. Kawa, J. Crawford, J. Fishman, D. Neil, R. Eckman, D. Edwards, A. Eldering, L. Iraci, D. Jacob, M. Newchurch, C. Zehner (2010), Status of the NASA GEO-CAPE mission and an international air quality constellation, 2010 EUMETSAT Meteorological Satellite Conference, Córdoba, Spain, 20-24 September.
166. Buckley, P. I., D. A. Bowdle, M. J. Newchurch (2010), Application of Extractive Cryogenic Preconcentration with Fourier Transform Infrared Spectroscopy: Preliminary Laboratory and Field Results, NOAA ESRL Global Monitoring Annual Conference, Boulder, CO, 18-19 May.
165. Buckley, P. I., D. A. Bowdle, M. J. Newchurch (2010), Application of Extractive Cryogenic Preconcentration with Fourier Transform Infrared Spectroscopy: Preliminary Laboratory and Field Results, AMS 90th Annual Meeting, Atlanta, GA, 17-21 January.
164. Kim, J. H., S. M. Kim, and M. Newchurch (2010), The analyses of satellite-derived HCHO measurements with statistical approaches, AMS 90th Annual Meeting, Atlanta, GA, 17-21 January.
163. Kuang, S., M. Newchurch, and J. Burris (2010), 10-min Variations in PBL/FT Ozone from DIAL Measurements in Huntsville, AMS 90th Annual Meeting, Atlanta, GA, 17-21 January.
162. Newchurch, M., L. Wang, A. P. Biazar, M. Khan, X. Liu, D. W. Byun, B. Pierce (2010) Application of OMI ozone profiles in CMAQ, The 90th American Meteorological Society Annual Meeting, Atlanta GA, 17-21 January.
161. Wang, L., M. Newchurch, A. Biazar, and W. Koshak, and X. Liu (2010) Influence of Lightning NO_x on Upper Tropospheric Ozone Concentration, AMS 90th Annual Meeting, Atlanta, GA, 17-21 January.
160. Biazar, A., M. Khan, M. Newchurch, L. Wang, Y.-H. Park, X. Liu, D. W. Byun (2009), Examining the utilization of satellite observations in improving air-quality predictions, International Workshop on Air Quality Forecasting Research, Boulder, CO, 2-3 December.
159. Buckley, P. I., D. A. Bowdle, M. J. Newchurch, R. Dillard (2009), Application of extractive cryogenic preconcentration with FTIR spectroscopy for autonomous measurements of gaseous air toxics: Status and preliminary results, National Ambient Air Monitoring Conference, Nashville, TN, 2-5 November.
158. Biazar, A. P., R. T. McNider, M. Khan, M. Newchurch, W. J. Koshak, G. Jedlovec, J. E. Pleim, X. Liu, G. Osterman, D. W. Byun, K. Chance, T. P. Kurosu (2009) Incorporating Space-borne Measurements to Improve Air Quality Decision Support System, NASA Applied Science Air Quality Team meeting, Washington, D. C., 27-29 October.
157. Kim, J. H., S. M. Kim, M. Newchurch (2009), The analyses of satellite-derived HCHO measurements with statistical approaches, EOS Aura Science Team Meeting, Leiden, The Netherlands, 14-17 September.
156. Newchurch, M., S. Kuang, J. Burris (2009), 10-min Variations in PBL/FT Ozone from DIAL Measurements in Huntsville, EOS Aura Science Team Meeting, Leiden, The Netherlands, 14-17 September.
155. Newchurch, M., L. Wang, A. Biazar, M. Khan, X. Liu, D. Byun, B. Pierce (2009), Application of OMI Ozone Profiles in CMAQ, EOS Aura Science Team Meeting, Leiden, The Netherlands, 14-17 September.
154. Kuang, S., J. Burris, M. J. Newchurch, S. Johnson, S. Long (2009), Sub-hourly Variation of Tropospheric Ozone Profiles Measured by the Huntsville DIAL, Washington, DC, 7 May.
153. Wang, L., M. Newchurch, A. Biazar, M. Khan, X. Liu (2009), Application of OMI Ozone Profiles in CMAQ, 4th GEOS-Chem Users' Meeting, Cambridge, MA, 7-10 April.
152. Koshak, W., M. Khan, A. Biazar, M. Newchurch, R. McNider (2009), A NASA Lightning Parameterization for CMAQ, 89th AMS Annual Meeting, 11-15 January, Phoenix, AZ.
151. Wang, L., M. Newchurch, A. Biazar, M. Khan, X. Liu (2009), Application of OMI ozone profiles in CMAQ, 4th GEOS-Chem Users' Meeting, Cambridge, MA, 7-10 April.

150. Kim, J.-H., S. Kim, K. J. Ha, M. Newchurch (2008), OMI total-ozone anomaly and its impact on tropospheric ozone retrieval, EOS Aura ST, Columbia, MD, 27-30 October.
149. Newchurch, M., A. Pour-Biazar, M. Khan, X. Liu, L. Wang, D. Byun, B. Pierce, B. Koshak, R. Williams, S. Kuang, J. Burris, Y. Park (2008), AURA OMI Ozone Profiles for Large-scale CMAQ Boundary Conditions with Lightning Effects RAPCD Ozone Lidar for Fine-scale Tropospheric Ozone Variations, EOS Aura ST, Columbia, MD, 27-30 October.
148. Mount, G. H., E. Spinei, P. K. Bhartia, J. Herman, S. Sander, S. Wang, Thomas Pongetti, T. Kuruso, K. Chance, M. Newchurch, S. Carn, N. Krotkov, A. Krueger (2008), OMI Validation with the Ground-Based WSU MFDOAS Spectrometer, AURA ST, Columbia, MD, 27 - 30 October.
147. Newchurch, M., A. Biazar, M. Khan, B. Koshak, U. Nair, K. Fuller, L. Wang, Y. Park, R. Williams, S. Christopher, J. Kim, X. Liu, D. Byun, B. Pierce, K. Chance, T. Kurosu, W. Mcmillan (2008), Improvements in Air-Quality Forecasts from Satellite Observations, Geostationary Coastal and Air Pollution Events Science Definition Planning Workshop, Chapel Hill, NC, 18-20 August.
146. Newchurch, M., S. Kuang, J. Burris, S. Johnson (2008), DIAL Measurements of Free-Tropospheric Ozone Profiles in Huntsville, AL, 24th International Laser Radar Conference, Boulder, CO, 23-27 June.
145. Newchurch, M. J., Pour-Biazar, A., Khan, M., Koshak, B., Nair, U., Fuller, K., Wang, L., Park, Y., Williams, R., Christopher, S., Kim, J., Liu, X., Byun, D. W., Pierce, B. (2008), Experiment to Improve Air-Quality Forecasts with NASA Satellite Observations, JCSDA 6th Workshop on Satellite Data Assimilation, Linthicum, MD, 10-11 June.
144. Kim, J., S. Kim, M. J. Newchurch (2008), The intercomparison of tropical tropospheric compositions measured from satellite, OMI Meeting, Helsinki, Finland, 24-27 June.
143. Newchurch, M., A. Pour-Biazar, M. Khan, B. Koshak, U. Nair, K. Fuller, L. Wang, Y. Park, R. Williams, X. Liu (2008), Improving air quality forecasts with AURA observations, Eos Trans. AGU, 89(23), Jt. Assem. Suppl., Abstract A23A-03.
142. Yang, E.-S., R. J. Salawitch, D. M. Cunnold, M. J. Newchurch, M. P. McCormick, J. M. Russell III, J. M. Zawodny, S. J. Oltmans (2008), Antarctic ozone: Depletion and recovery, Eos Trans. AGU, 89(23), Jt. Assem. Suppl., Abstract A53A-04.
141. Kim, J. H., M. J. Newchurch, S. Na, S. Kim, R. V. Martin (2007), Singular value decomposition analyses of tropical tropospheric ozone determined from satellites, AGU Fall Meeting, San Francisco, CA, 10-14 December.
140. Newchurch, M. J., J. H. Kim, S. Kim, M. Luo, R. Martin, B. Sauvage (2007), Tropical tropospheric ozone analyses measured from TOMS and AURA, JPL AURA Workshop, Pasadena, CA, 30 Sept.-5 Oct.
139. Thompson, A. M., J. C. Witte, T. Kucsera, J. E. Yorks, S. K. Miller, et al. (2007), Insights into Mega-City Ozone Pollution from the IONS (INTEX Ozonesonde Network Study, 2004 & 2005) Ozonesonde Network, Eos Trans. 88(23), Jt. Assem. Suppl., Abstract A32A-06.
138. Patrida, F., U. S. Nair, R. T. McNider, S. A. Christopher, K. A. Fuller, R. M. Welch, D. A. Bowdle, M. J. Newchurch (2007), Impact of atmospheric aerosols on nocturnal boundary layer temperatures, abstract presented at the Experimental Program to Stimulate Competitive Research (EPSCoR) Program Review Workshop, Golden, CO, 23-25 July.
137. Newchurch, M. J., S. Kuang, J. Burris, S. Johnson (2006), Tropospheric ozone measurement using Differential Absorption Lidar, AURA Science Team Meeting, Boulder, CO, 10 September.
136. Newchurch, M. J., A. Biazar, D. Bowdle, S. Christopher, K. Fuller, K. Knupp, R. McNider, J. Mecikalski, U. Nair, K. Fuller, Q. Han (2006), Vertical distribution of air-quality gases and aerosols, AGU Spring Meeting, Baltimore, MD, 22 May.
135. Newchurch, M. J., D. Bowdle, J. Mecikalski, W. Petersen, K. Knupp, D. McNider, D. Emmitt, M. Hardesty, S. Johnson, (2006), Development of a remote-sensing testbed for tropospheric air quality and winds, Working Group on Space-Based Lidar Winds, Key West, FL, 17-20 January.
134. Cunnold, D. M., E.-S. Yang, R. J. Salawitch, M. J. Newchurch (2005), The influence of loss saturation effects on the assessment of polar ozone changes, AGU Fall Meeting, San Francisco, CA, 3 December.

133. Newchurch, M. J., A. Biazar, M. Botts, D. Bowdle, K. Fuller, K. Knupp, D. McNider, J. Mecikalski, U. Nair, W. Petersen (2005), Where the Terrain meets the Atmosphere, Huntsville Terrain Summit, Huntsville, AL, 8 November.
132. Newchurch, M. J., A. Biazar, M. Botts, D. Bowdle, K. Fuller, K. Knupp, D. McNider, J. Mecikalski, U. Nair, W. Petersen (2005), Tactical-scale Atmospheric Information System, The Huntsville Simulation Conference, Huntsville, AL, 27 October.
131. Irion, F. W., M. J. Newchurch, S. Na, J. Worden, S.-Y. Lee, M. R. Gunson (2005), Upper tropospheric and lower stratospheric ozone retrievals from AIRS, AGU Fall Meeting, San Francisco, CA.
130. Yang, E.-S., D. Cunnold, R. Salawitch, P. McCormick, J. Russell, J. Zawodny, R. Stolarski, R. McPeters, S. Oltmans, M. J. Newchurch (2005), First Stage of Recovery in the Stratospheric Ozone Layer, AGU Spring Meeting, New Orleans, LA, 23-27 May.
129. Irion, F. W., M. R. Gunson, M. J. Newchurch, S. Na (2005), Ozone validation for AIRS V4, AIRS Science Team Meeting, 3 May.
128. Yang, E.-S., D. Cunnold, R. Salawitch, P. McCormick, J. Russell, J. Zawodny, R. Stolarski, R. McPeters, S. Oltmans, M. J. Newchurch (2005), First Stage of Recovery in the Stratospheric Ozone Layer, AURA Workshop, Pasadena, CA, 2 March.
127. Yang, E. D. M. Cunnold, R. J. Salawitch, M. P. McCormick, J. R. Russell III, J. M. Zawodny, S. J. Oltmans (2005), Evidence for the End of the Decline in the Stratospheric Ozone Layer, *Eos Trans. AGU*, 86(18), Jt. Assem. Suppl., Abstract A53B-06.
126. Chance, K., X. Liu, C. E. Sioris, R. J. Spurr, T. P. Kurosu, R. V. Martin, M. Fu, P. I. Palmer, D. J. Jacob, M. J. Newchurch, P. K. Bhartia (2005), Global Distribution of Tropospheric Ozone from GOME and Comparison with GEOS CHEM Model Results, *Eos Trans. AGU*, 86(18), Jt. Assem. Suppl., Abstract A21A-13.
125. Liu, X., K. Chance, C. Sioris, R. Spurr, T. Kurosu, R. Martin, M. J. Newchurch, P. K. Bhartia (2004), Direct Tropospheric Ozone Retrieval from GOME, AGU Fall Meeting, San Francisco, CA, 17 December.
124. Liu, X., K. Chance, C. E. Sioris, R. J. D. Spurr, T. P. Kurosu, R. V. Martin, M. J. Newchurch, P. K. Bhartia (2004), Ozone profiles and tropospheric ozone from global ozone monitoring experiment, Envisat Symposium, Salzburg, Austria, 6-10 September.
123. Chance, K., X. Liu, C. E. Sioris, R. J. D. Spurr, T. P. Kurosu, R. V. Martin, M. J. Newchurch, P. K. Bhartia (2004), Ozone Profile Retrieval from GOME. Quadrennial Ozone Symposium, Kos, Greece, 8 June.
122. Newchurch, M. J., E. Yang, D. Cunnold, G. Reinsel, R. Salawitch, J. Zawodny, J. M. Russell III, M. P. McCormick, P. K. Bhartia (2004). First Stage of Stratospheric Ozone Recovery. *invited talk*, Quadrennial Ozone Symposium, Kos, Greece, 2-8 June.
121. Timofeyev Yu. M., Ya. A. Virolainen, A. V. Polyakov, A. V. Vasilyev, H. M. Steele, M. J. Newchurch (2004), New method for interpreting the limb scattered solar radiance measurements. International Radiation Symposium (IRS2004), Busan, Korea, 23-28 August.
120. Polyakov A. V., Yu. M. Timofeyev, V. S. Kostsov, Ya. A. Virolainen, D. V. Ionov, A. M. Chaika, H. M. Steele, M. J. Newchurch (2004), Trace gas and aerosol sounding of the atmosphere in the Sun occultation experiment with SAGE III device. International Radiation Symposium (IRS2004), Busan, Korea, 23-28 August.
119. Newchurch, M. J., K. A. Fuller, D. A. Bowdle, S. Johnson, R. T. McNider, K. Knupp, B. Lapenta, N. Gillani, A. Biazar, (2004), Vertical Profiling of air pollution at RAPCD, invited, SPIE 49th Annual Meeting, Optical Science and Technology, Denver, Colorado, 2-6 August.
118. Emmitt, G. D., D. A. Bowdle, M. J. Newchurch, R. T. McNider, K. R. Knupp, Q. Han, K. A. Fuller, N. V. Gillani, A. Biazar, M. E. Botts, K. G. Doty, and S. Johnson, (2004), "Prospectus for a CHEM/CLOUD EXPERIMENT Using Multiple Doppler Lidars in Huntsville, Alabama." Presented at Working Group on Space-Based Lidar Wind, Frisco, Colorado, 29 June - 1 July.
117. Timofeyev Yu. M., Ya. A. Virolainen, A. V. Polyakov, A. V. Vasilyev, H. M. Steele, M. J. Newchurch (2004), Method for withdrawing the information on atmospheric aerosol characteristics from limb measurements of scattered solar radiation. International Symposium of former USSR countries on Atmospheric Radiation (ISAR-2004), St. Petersburg, Russia, 22-25 June.
116. Polyakov A. V., Yu. M. Timofeyev, V. S. Kostsov, Ya. A. Virolainen, D. V. Ionov, A. M. Chaika, H. M. Steele, M. J. Newchurch (2004), Retrieval of trace gases and aerosol components of the

- atmosphere from satellite occultation measurements of solar radiation by SAGE III device. International Symposium of former USSR countries on Atmospheric Radiation (ISAR-2004), St. Petersburg, Russia, 22-25 June.
115. Polyakov, A. V., Y. M. Timofeyev, D. V. Ionov, V. S. Kostsov, Y. A. Virolainen, H. M. Steele, M. J. Newchurch (2004), Trace gas and aerosol sounding of the atmosphere in the Sun occultation experiment with SAGE III device, SOSST Meeting, Boulder, Colorado, 15-17 June.
 114. Timofeyev, Y. M., A. V. Polyakov, A. V. Vasilyev, Y. A. Virolainen, H. M. Steele, M. J. Newchurch (2004), Statistical approach for the aerosol retrieval from limb scattered solar radiation, SOSST Meeting, Boulder, Colorado, 15-17 June.
 113. Chance, K., X. Liu, C. E. Sioris, R. J. D. Spurr, T. P. Kurosu, R. V. Martin, M. J. Newchurch, P. K. Bhartia (2004), Ozone Profile Retrieval from GOME. Quadrennial Ozone Symposium, Kos, Greece, 2-8 June.
 112. Timofeyev Yu. M., A. V. Polyakov, V. S. Kostsov, Yu. A. Virolainen, D. V. Ionov, M. J. Newchurch, H. M. Steele (2004), Ozone, nitrogen dioxide, and aerosol extinction profiles from SAGE III measurements. Quadrennial Ozone Symposium (QOS), Athens, Greece, 31 May - 7 June.
 111. Timofeyev Yu. M., A. V. Polyakov, A. V. Vasilyev, Y. A. Virolainen, M. J. Newchurch, H. M. Steele (2004), Method for retrieving the information on atmospheric aerosol characteristics from limb scattered measurements. The 2004 joint AGU-CGU Assembly, 1 Montreal, Canada, 7-21 May.
 110. Newchurch, M. J. (2004), Regional Atmospheric Profiling Center for Discovery (RAPCD at NSSTC), Homeland Security Department visit to UAH, Huntsville, AL, 31 March.
 109. Newchurch, M. J. (2004), The Regional Atmospheric Profiling Center for Discovery (RAPCD), *invited talk*, 7th Annual Southeast Ultrafast and High-Resolution Spectroscopy Conference, 15-17 January.
 108. Fishman, J., S. Chandra, A. M. Thompson, J. R. Ziemke, R. D. Hudson, M. J. Newchurch, J. K. Creilson, A. E. Wozniak (2003), Tropospheric Ozone from TOMS: Providing the First Depictions of the Extent of Global Pollution. *invited talk*, EOS Trans. AGU, 84(46), Fall Meet. Suppl., Abstract A11A-05.
 107. Irion, F. W., M. J. Newchurch, M. A. Ayoub, A. Eldering, S. Lee, M. R. Gunson (2003), Validation of AIRS Column Ozone Retrievals. EOS Trans. AGU, 84(46), Fall Meet. Suppl., Abstract H32B-0563.
 106. Lightner, K. J., W. W. McMillan, M. J. Newchurch, E. J. Hintsa (2003), Tropospheric O₃ Retrievals from the Baltimore Bomem Atmospheric Emitted Radiance Interferometer (BBAERI) during AIRS Validation. EOS Trans. AGU, 84(46), Fall Meet. Suppl., Abstract H31A-04.
 105. Liu, X., M. J. Newchurch, J. Kim, P. K. Bhartia, R. Loughman (2003), TOMS Ozone Anomalies and Ozone Retrieval Errors Over Cloudy Areas. EOS Trans. AGU, 84(46), Fall Meet. Suppl., Abstract A21D-0992.
 104. Newchurch, M. J., E. Yang, D. Cunnold, G. C. Reinsel, J. M. Zawodny, J. M. Russell (2003). First Stage of Upper-stratospheric Ozone Recovery, *invited talk*, EOS Trans. AGU, 84(46), Fall Meet. Suppl., Abstract A51G-02 INVITED.
 103. Newchurch, M., R. Loughman, P. K. Bhartia, and J. H. Kim (2003), TOMS Ozone Anomalies and Ozone Retrieval Errors Over Cloudy Areas, Eos Trans AGU, Fall Meet. Suppl.
 102. Newchurch, M. J., J. H. Kim, S. Na, R. V. Martin (2003), Tropical tropospheric ozone morphology and seasonality seen in satellite, model, and in-situ measurements: No paradox in North Africa. *invited talk*, EOS Trans. Trans. AGU, 84(46), Fall Meet. Suppl., Abstract A51G-02 INVITED.
 101. Yang, E., D. M. Cunnold, M. J. Newchurch, G. C. Reinsel, J. M. Zawodny, J. M. Russell (2003), Rigorous Metric for Quantifying Ozone Recovery. EOS Trans. AGU, 84(46), Fall Meet. Suppl. Abstract A41D-0718.
 100. Kim, J. H., S. Na, M. J. Newchurch (2003), Evolution of Tropospheric Ozone Derived from Scan Angle Geometry Method (SAM).
 99. Timofeyev, Y. M., A. V. Polyakov, V. S. Kostsov, Yu. A. Virolainen, H. M. Steele, M. J. Newchurch, K. Drdla (2003), The Use of Statistical Models of Aerosols and Clouds in Remote Sensing.
 98. Newchurch, M. J., R. Loughman, X. Liu, and P. K. Bhartia (2003), Ozone Retrieval Errors Associated with Clouds in Total Ozone Mapping Spectrometer (TOMS) Data, TOMS Science Meeting, Boulder, CO, 22-24 April.
 97. Newchurch, M. J., R. McPeters, J. Logan, J. H. Kim (2003), Report to the TOMS Science Team, TOMS Science Team Meeting, NOAA Boulder Laboratory, 21 April.

96. Newchurch, M., M. Ayoub, S. Oltmans, B. Johnson, and F. Schmidlin (2003), Vertical Distribution of Ozone at Four Sites in the United States, TOMS Science Meeting, Boulder, CO, 22-24 April.
95. Newchurch, M. J., et al. (2003), Atmospheric Chemistry at UAH, Physics Department UAH, 25 January.
94. Newchurch, M. J., M. Ayoub, S. Oltmans, B. Johnson, F. Schmidlin, Vertical Distribution of Ozone at Four Sites in the United States, Aura Validation Meeting, Boulder, CO, September 17, 2002.
93. Liu, X., M. J. Newchurch, J. Kim (2002), Lower-tropospheric Ozone Derived from TOMS V7 Level-2 Data, AURA Validation Meeting, Boulder, CO, 17 September.
92. Liu, X., M. J. Newchurch, J. Kim (2002), TOMS Accuracy over High Convective Cloudy Areas, AURA Validation Meeting, Boulder, CO, 17 September.
91. Liu X., M. J. Newchurch, R. Loughman, P. K. Bhartia (2002), TOMS Ozone Retrieval Sensitivity to Assumption of Lambertian Cloud Surface (II), AURA Validation Meeting, Boulder, CO, 17 September.
90. Newchurch M., D. Sun, X. Liu, J. H. Kim, R.V. Martin, D. Jacob, J. Logan, K. Han, S. Na (2002), Critical Assessment of TOMS-derived Tropospheric Ozone: Comparisons with Other Measurements and Model Evaluation of Controlling Processes, AURA Validation Meeting, Boulder, CO, 17 September.
89. Newchurch, M. J. and D. A. Bowdle (2002), Regional Atmospheric Profiling Center for Discovery (RAPCD) at the Global Hydrology and Climate Center: Status and Plans, Working Group on Space-Based Lidar Winds, North Conway, New Hampshire, 15-18 July.
88. Newchurch, M. J., X. Liu, D. Sun, M. Ayoub, R. Martin, J. H. Kim (2002), Tropical Tropospheric Ozone from TOMS, Sondes, GOME, and Models: How well do we understand?, *invited talk*, Harvard University, 17 May.
87. Liu, X., M. J. Newchurch, R. Loughman, P. K. Bhartia (2002), TOMS Ozone Retrieval Errors Associated with Clouds, Harvard-Smithsonian Center for Astrophysics, Cambridge, 18-19 April.
86. Newchurch, M. J., M. Ayoub, S. Oltmans, B. Vasel, B. Johnson, R. McNider (2002), Ozonesondes During TexAQS 2000, 82nd Annual AMS Spring Meeting, January.
85. Ayoub, M., M. J. Newchurch, S. Oltmans, B. Vasel, B. Johnson, R. McNider (2002), Daily Variability in Tropospheric Ozone Profiles at TexAQS Within the Context of a US Tropospheric Ozone Climatology, 82nd Annual AMS Spring Meeting, January.
84. Liu, X., M. J. Newchurch, R. Laughman, P. K. Bhartia (2001), TOMS Ozone Retrieval of Lambertian Cloud Surface Part 1. Scattering Phase Function, TOMS Science Meeting, Greenbelt, MD, October.
83. Liu, X., M. J. Newchurch, R. Laughman, P. K. Bhartia (2001), TOMS Ozone Retrieval of Lambertian Cloud Surface Part 2. In-cloud Multiple Scattering, TOMS Science Meeting, Greenbelt, MD, October.
82. Newchurch, M. J., et al. (2001), Regional Atmospheric Profiling Center for Discovery (RAPCD): Validating EOS Satellite Ozone Measurements, EOS IWG, San Antonio, TX, October.
81. Newchurch, M. J., X. Liu, J. H. Kim, P. K. Bhartia (2001), Accuracy of TOMS Retrievals over Cloudy Regions, October.
80. Newchurch, M. J., D. Sun, X. Liu, J. H. Kim, R. V. Martin, D. Jacob, J. Logan, K. Han, S. Na (2001), Critical Assessment of TOMS-derived Tropospheric Ozone: Comparisons with Other Measurements and Model Evaluation of Controlling Processes, TOMS Science Team Meeting, Greenbelt, MD, October.
79. Newchurch, M. J., M. Ayoub, A. Biazar, D. Bowdle, S. Christopher, K. Fuller, N. Gillani, Q. Han, K. Knupp, X. Liu, D. McNider, D. Sun, J. Fix, M. Jarzembski, B. Lapenta, J. Rothermel, P. K. Bhartia, T. McGee, M. Hardesty, V. Srivastava (2001), Regional Atmospheric Profiling Center for Discovery (RAPCD), National Space Science and Technology Center, Huntsville, AL, October.
78. Newchurch, M. J., M. Ayoub, S. Oltmans, B. Vasel, B. Johnson, R. McNider (2001), Ozonesondes During TexAQS 2000, National Space Science and Technology Center, Huntsville, AL, October.
77. Kim, J. H., S. M. Na, M. J. Newchurch (2001), Distribution of Tropospheric ozone using Scan-Angle-Geometry Method, Korean Met. Soc.
76. Ayoub, M., M. J. Newchurch, S. Oltmans, B. Vasel, B. Johnson, R. McNider (2001), Daily Variability in Tropospheric Ozone Profiles at TexAQS Within the Context of a US Tropospheric Ozone Climatology, National Space Science and Technology Center, Huntsville, AL, October.

75. Ayoub, M., M. J. Newchurch, B. Vasel, B. Johnson, S. Oltmans, R. McNider (2001), Vertical Ozone Profiles at TexAQS 2000, Texas 2000 Air Quality Study (TexAQS 2000) Science Team Meeting, 7-10 August.
74. Newchurch, M. J., D. Sun, X. Liu, L. Emmons, D. Kinnison, X. X. Tie, L. Horowitz, J. H. Kim, K. Han, S. Na, G. Brasseur, D. Jacob, J. Logan, R. V. Martin (2001), Tropical Tropospheric Ozone: Global Measurements and Modeling, measurement/model comparison seminar at NCAR, Boulder, CO, 20 July.
73. Newchurch, M. J., et al. (2001), Regional Atmospheric Profiling Center for Discovery (RAPCD): Request for community critique, NCAR, Boulder, CO, July.
72. Newchurch, M. J., D. Sun, X. Liu, L. Emmons, L. Horowitz, J. H. Kim, D. Kinnison, G. Brasseur, D. Jacob, J. Logan, R. V. Martin, K. Han, S. Na (2001), Critical Assessment of TOMS-derived Tropospheric Ozone: Comparisons with Other Measurements and Model Evaluation of Controlling Processes, *Eos. Trans. AGU*, 82 (20), Spring Meet. Suppl., Abstract A52A-09.
71. Cunnold, D. M., J. M. Zawodny, L. W. Thomason, E. Yang, M. J. Newchurch (2001), Ozone validation and trends near the tropopause from SAGE V6.0 observations, *Eos. Trans. AGU*, 82 (20), Spring Meet. Suppl., Abstract A52A-12.
70. Cunnold, D. M., H. Wang, E. Yang, M. J. Newchurch (2001), Investigation of upper-stratospheric ozone trends and hemispheric asymmetries in SAGE II version #6.0, *Eos. Trans. AGU*, 82 (20), Spring Meet. Suppl., Abstract A52B-04.
69. Newchurch, M. J., D. Sun, X. Liu, and J. Kim (2001), Tropospheric Ozone Distributions from TOMS: A Case for Considering Tropospheric Processes, IOC/SPARC Workshop for Understanding Ozone Trends, University of Maryland, 7-9 March.
68. Newchurch, M. J., D. Cunnold, E. Yang (2001), Upper-Stratospheric Ozone Trends, IOC/SPARC Workshop for Understanding Ozone Trends, University of Maryland, 7-9 March.
67. Newchurch, M. J., X. Liu, D. Sun, M. Ayoub, J. Kim, G. Brasseur, L. Emmons, L. Horowitz, P. K. Bhartia, R. McPeters (2001), Tropospheric Ozone and the NSSTC Regional Atmospheric Profiling Center for Discovery, RAPCD, presented at National Space Science and Technology Center, Huntsville, AL, 21 February.
66. Ayoub, M., M. J. Newchurch, D. McNider (2000), SOS99 Tropospheric Ozone: Overview of Tropospheric Ozone Over Old Hickory, TN During the Southern Oxidants Study 1999 Field Intensive, NSSTC, Huntsville.
65. Kim, J. H., M. J. Newchurch, K. Han (2000), Distribution of tropical tropospheric ozone directly determined from TOMS scan angle geometry, Proceedings of the Quadrennial Ozone Symposium, Sapporo.
64. Kim, J. H., M. J. Newchurch, K. Han (2000), Distribution of tropical tropospheric ozone directly determined from TOMS measurements, Proceeding of Atmospheric Science and Application to Air Quality, Taipei.
63. Herwehe, J. A., R. T. McNider, M. J. Newchurch (2000), A numerical study of the effects of large eddies on photochemistry in the convective boundary layer. In Preprints of the AMS 14th Symposium on Boundary Layers and Turbulence, Aspen, Co., 7-11 August.
62. Newchurch, M. J., J. H. Kim, D. Sun, X. Liu, A. Thompson (2000), Tropical Tropospheric Ozone from a Variety of TOMS-derived Techniques and Ozonesondes, AGU Spring Meeting, Washington DC, 29 March – 2 June.
61. Kim, J. H., M. J. Newchurch, K. Han (2000), Distribution of Tropospheric Ozone Column Determined Directly from TOMS Measurements, TOMS Meeting, Huntsville, AL, 3-5 May.
60. Liu, X., M. J. Newchurch, J. H. Kim (2000), Lower-tropospheric Ozone Derived from TOMS V7 Level-2 Data, TOMS Meeting, Huntsville, AL, 3-5 May.
59. Liu, X., M. J. Newchurch, D. Sun, J. H. Kim (2000), TOMS Accuracy over High Convective Cloudy Areas, TOMS Meeting, Huntsville, AL, 3-5 May.
58. Liu, X., M. J. Newchurch, J. H. Kim (2000), Occurrence of TOMS V7 Level-2 Ozone Anomalies over Cloudy Areas, TOMS Meeting, Huntsville, AL, 3-5 May.
57. Newchurch, M. J., M. Ayoub, B. Johnson, S. Oltmans (2000), Huntsville, Alabama Ozonesonde Station, TOMS Meeting, Huntsville, AL, 3-5 May.

56. Newchurch, M. J., X. Liu, D. Sun, J. H. Kim (2000), Report to the TOMS Science Team, TOMS Meeting, Huntsville, AL, 3-5 May.
55. Sun, D., M. J. Newchurch, J. H. Kim (2000), The Stratospheric Ozone Wave in Tropical Area, TOMS Meeting, Huntsville, AL, 3-5 May.
54. Sun, D., M. J. Newchurch, X. Liu, J. H. Kim (2000), Tropical Tropospheric Ozone Using Clear-Cloudy Pairs (CCP) of TOMS Measurements, TOMS Meeting, Huntsville, AL, 3-5 May.
53. Ayoub, M., M. J. Newchurch, D. McNider (2000), Variations in Upper-atmospheric Ozone as Seen with the Daily Ozonesondes, SOS Data Analysis Workshop, Research Triangle Park, NC, 8-10 March.
52. Newchurch, M. J., M. Ayoub, D. McNider (2000), Conjectures on processes controlling measured ozone profiles in Nashville 1999, Weather Research and Forecasting Model Workshop, NCAR, Boulder, CO, 6-8 March.
51. Newchurch, M. J. (1999), Umkehr Ozone Validation Considerations, Umkehr Review Meeting, World Ozone and Ultraviolet Data Center, Toronto, Canada, 17 November.
50. Newchurch, M. J. (1999), Tropical Tropospheric Ozone Observations, *invited talk*, GHCC, Huntsville, AL, 13 October.
49. Newchurch, M. J. (1999), Ozone Profiles and Trends; NO₂ Comparisons, Report to the SAGE II Science Team, Hampton, VA, 16-17 August.
48. Newchurch, M. J., D. A. Bowdle (1999), Particulate Retrievals from ATMOS Solar Occultation Spectra, ATMOS Science Team Meeting, Pasadena, CA, 27 May.
47. Newchurch, M. J., L. Emmons (1999), ATMOS, MOZART and Data Composites, ATMOS Science Team Meeting, Pasadena, CA, 27 May.
46. Newchurch, M. J. (1999), ATMOS-SAGE NO₂ Comparisons, ATMOS Science Team Meeting, Pasadena, CA, 27 May.
45. Newchurch, M. J., X. Liu, D. Sun, J. Kim (1999), Report to the TOMS Science Team, GSFC, Greenbelt, MD, 7-8 April.
44. Newchurch, M. J. (1999), Dobson and Brewer Umkehr Ozone-profile Measurements, Workshop by USGCRP Ozone/Atmospheric Chemistry Group and OFCM Working Group on Monitoring the Stratosphere Maintaining Continuity in Space-Based Ozone Data in 2000-2003 Time Frame, *invited talk*, World Weather Building, Camp Springs, MD, 4 February.
43. Newchurch, M. J., J. H. Kim (1998), Biomass-burning Influence on Tropical Tropospheric Ozone AGU Fall Meeting, San Francisco, CA, 8 December.
42. Newchurch, M. J., et al. (1998), Stratospheric Ozone Trends: Results from the IOC/SPARC Ozone Trends Assessment and the WMO/UNEP 1998 Assessment, *invited talk*, GHCC, Huntsville, AL, November.
41. Newchurch, M. J., et al. (1998), Stratospheric Ozone Trends: Summary of the IOC/SPARC Ozone Trends Assessment, *invited talk*, NCAR, Boulder CO, June.
40. Newchurch, M. J., et al. (1998), Trends in Upper-stratospheric Ozone, *invited talk*, AGU spring meeting, Boston, MA, 27 May.
39. Newchurch, M. J. (1998), The ozone deficit, *invited talk*, NCAR, Boulder, CO, April.
38. Newchurch, M. J. (1998), Report to the TOMS Science Team, GSFC, Greenbelt, MD, 20-22 April.
37. Newchurch, M. J. (1998), Report to the SAGE II Science Team: SAGE and Umkehr Ozone Profiles and Trends, Hampton University, Hampton, VA, 12 February.
36. Yang, E. S., M. J. Newchurch (1988), A Multivariate Auto-regressive Combined Harmonics (MARCH) Approach to Time Series Data, *invited talk*, NCAR, Boulder, CO, 6 February.
35. Kim, J. H., M. J. Newchurch, R. D. Hudson, A. Thompson (1998), On the Derivation of Tropospheric Ozone from TOMS Measurements, *invited talk*, NCAR, Boulder, CO, 2 February.
34. Newchurch, M. J., J. H. Kim (1997), Derivation of Tropospheric Ozone Climatology and Trends from TOMS Data, presented at Yonsei University, Seoul, Korea, 16 December.
33. Newchurch, M. J., J. H. Kim (1997), Biomass-Burning Influence on TOMS-derived Tropospheric Ozone in the Tropics, AGU Fall Meeting, San Francisco, CA, 8 December.
32. Newchurch, M. J., E. S. Yang (1997), Upper-stratospheric Ozone Trends, presented at SPARC/IOC Review Meeting on Trends in the Vertical Distribution of Ozone, Cosener's House, Abingdon, U.K., 14-16 October.

31. Newchurch, M. J., E. S. Yang (1997), Stratospheric Ozone Trends Measured by Dobson/Umkehr, SAGE and SBUV, presented at POAM Science Team Meeting, Cool Font, West Virginia, 8-10 October.
30. Newchurch, M. J., J. H. Kim (1997), Biomass-Burning influence on tropospheric ozone over New Guinea and South America, presented at the Gordon Research Conference on Atmospheric Chemistry, Newport, Rhode Island, June.
29. Newchurch, M. J., J. H. Kim (1997), Biomass-Burning influence on tropospheric ozone over New Guinea and South America, presented at the IGAC-SPARC-GAW Conference on Global Measurement Systems for Atmospheric Composition, Toronto, Canada, 20-22 May.
28. Newchurch, M. J., D. Cunnold, C. Mateer, J. Cao (1997), Umkehr[64] and Umkehr[92] ozone profiles and time series compared to SAGE, presented at IGAC-SPARC-GAW Conference on Global Measurement Systems for Atmospheric Composition, Toronto, Canada, 20-22 May.
27. Newchurch, M. J. (1996), 67 years of Dobson Umkehr Observations: An Overview, presented at SPARC/IOC Meeting on Trends in the Vertical Distribution of Ozone, Observatoire de Haute Provence Saint Michel l'Observatoire, France, 8-12 July.
26. Newchurch, M. J., D. Cunnold, J. Cao (1996), Umkehr and SAGE Ozone Profile Comparisons, presented at SPARC/IOC Meeting on Trends in the Vertical Distribution of Ozone, Observatoire de Haute Provence Saint Michel l'Observatoire, France, 8-12 July.
25. Newchurch, M. J., E. S. Yang (1996), Some Considerations in Deriving Umkehr Ozone Trends, presented at SPARC/IOC Meeting on Trends in the Vertical Distribution of Ozone, Observatoire de Haute Provence Saint Michel l'Observatoire, France, 8-12 July.
24. Newchurch, M. J. (1996), Umkehr and SAGE ozone: retrieval and a priori differences at 15 stations, paper presented at NOAA/CMDL annual meeting, Boulder, CO, 6-7 March.
23. Newchurch, M. J., D. M. Cunnold, M. Allen, B. M. Herman (1995), SAGE-Umkehr Ozone Profile Analyses, paper presented at DOE Atmospheric Chemistry Program Annual Meeting, Vienna, VA, 5-7 December.
22. Abbas, M. J., H. A. Michelsen, M. R. Gunson, M. C. Abrams, M. J. Newchurch, A. Y. Chang, A. Goldman, F. W. Irion, G. L. Manney, E. J. Moyer, R. Nagaraju, C. P. Rinsland, R. J. Salawitch, G. P. Stiller, R. Zander (1995), Hydrogen Budget of the Stratosphere from ATMOS/ATLAS Measurements of Water Vapor and Methane, paper presented at AGU Fall Meeting, San Francisco, CA, 11-15 December.
21. Abrams, M. C., M. R. Gunson, M. J. Newchurch (1995), ATMOS/ATLAS Observations of ozone and temperature in the middle atmosphere, paper presented at XXI General Assembly of IUGG, Boulder, CO, 2-14 July.
20. Newchurch, M. J., D. M. Cunnold, M. Allen, B. Herman (1995), Old and new Umkehr ozone profiles compared to SAGE II: Measurements and radiative transfer calculations, paper presented at XXI General Assembly of IUGG, Boulder, CO, 2-14 July.
19. Newchurch, M. J., D. M. Cunnold (1995), SAGE II and Umkehr ozone measurements in the lower stratosphere, paper presented at International Conference on Ozone in the Lower Stratosphere, Halkidiki, Greece, 15-20 May.
18. Chang, A. Y., R. J. Salawitch, M. R. Gunson, H. A. Michelson, M. C. Abrams, C. P. Rinsland, R. Zander, M. J. Newchurch, M. M. Abbas, G. P. Stiller, F. W. Irion (1995), Lifetimes of atmospheric source gases inferred from ATMOS measurements, paper presented at 5th Annual Meeting on Atmospheric Effects of Aviation Project, Virginia Beach, VA, 23 – 28 April.
17. Gunson, M. R., A. Y. Chang, H. A. Michelson, R. J. Salawitch, M. C. Abrams, C. P. Rinsland, R. Zander, M. J. Newchurch, M. M. Abbas, G. P. Stiller, F. W. Irion (1995), A comparison of ATMOS and ER-2 gas measurements during November 1994, paper presented at 5th Annual Meeting on Atmospheric Effects of Aviation Project, Virginia Beach, VA, 23 – 28 April.
16. Newchurch, M. J. (1995), Comparisons of old and new Umkehr to SAGE II ozone profiles and some preliminary ATMOS results, paper presented at NOAA/CMDL annual meeting, Boulder, CO, 7-10 March.
15. Newchurch, M. J., D. M. Cunnold, M. Allen, B. M. Herman (1994), SAGE-Umkehr Ozone analyses and related research, paper presented at DOE Atmospheric Chemistry Program, Seattle, WA, 18-19 October.

14. Newchurch, M. J. (1994), Report to the SAGE II Science Team, paper presented at SAGE II Science Team Meeting, Langley Research Center, Hampton, VA, 16 June.
13. Newchurch, M. J., D. M. Cunnold, M. Allen, B. M. Herman (1994), SAGE-Umkehr Ozone analyses, paper presented at DOE Atmospheric Chemistry Program, Nashville, TN, 19-20 January.
12. Newchurch, M. J., M. Allen, R. Stachnik (1993), Stratospheric chlorine partitioning modeling with SL-3 ATMOS and Balloon Microwave Limb Sounding measurements, paper presented at AGU Fall Meeting, San Francisco, CA, 6-10 December.
11. Newchurch, M. J. (1993), Empirical and theoretical study of Umkehr ozone profiles and aerosol effects using SAGE II data, paper presented at SAGE II Science Team Meeting, Langley Research Center, Hampton, VA, 16-18 June.
10. Newchurch, M. J., D. M. Cunnold (1992), SAGE II-Umkehr case study of ozone differences and aerosol effects from October 1984 to April 1989, paper presented at Quadrennial Ozone Symposium, Charlottesville, VA, 8-11 June.
9. Newchurch, M. J., G. P. Kubic, V. L. Griffin, J. Piccirillo (1991), Visible Earthlimb Radiance Profiles, paper presented at Midcourse Phenomenology Symposium, Huntsville, AL, 6-8 August.
8. Newchurch, M. J., D. M. Cunnold (1990), Comparison of SAGE II and Umkehr ozone profiles as functions of stratospheric optical depth, total ozone, season, and tropopause height, paper presented at the Topical Meeting on Optical Remote Sensing of the Atmosphere, Optical Society of America, Lake Tahoe, NV, 11-16 February.
7. Griffin, V. L., M. J. Newchurch (1990), A comparison of AVHRR radiances with airborne radiometer measurements, paper presented at the Topical Meeting on Optical Remote Sensing of the Atmosphere, Optical Society of America, Lake Tahoe, NV, 11-16 February.
6. Schmidt, E. O., M. J. Newchurch (1990), Analysis of radiometric knees using LOWTRAN, paper presented at Cloud Impacts on DoD Operations and Systems 1989/90, Monterey, California, 8-12 January.
5. Griffin, V. L., M. J. Newchurch (1990), A comparison of AVHRR radiances with airborne radiometer measurements, paper presented at Cloud Impacts on DoD Operations and Systems 1989/90, Monterey, California, 8-12 January.
4. Newchurch, M. J., V. L. Griffin, J. S. Gothart (1988), Climatology and characterization of tropical cirrus cloud radiometric properties, paper presented Cloud Impacts on DoD Operations and Systems, NSWC, White Oak, MD, 18-20 October.
3. Griffin, V. L., M. J. Newchurch (1988), Geophysical database for Thrusted Vector program, Cloud Impacts on DoD Operations and Systems, NSWC, White Oak, MD, 18-20 October.
2. Newchurch, M. J., G. W. Grams, D. M. Cunnold, J. J. DeLuisi (1988), A comparison of SAGE I and Umkehr ozone profiles including a search for Umkehr aerosol effects, paper presented at Quadrennial Ozone Symposium, Gottingen, Federal Republic of Germany, 8-13 August.
1. Newchurch, M. J., (1988) Geophysical Database for SDI (Classified), paper presented Passive Optical Signatures Symposium, Huntsville, Alabama, 10-12 May.

PROPOSAL AWARD HISTORY

Proposal Award History							
Contract	Account #	Proposal #	PI	Title	POP	Sponsor	Net Award
N/A	N/A	1991-474	Dr. Mike Newchurch, PI	Research Plan for Use of Atlas Data	7/25/1991	NASA MSFC	\$50,000
N/A	N/A	1992-417	Dr. Mike Newchurch, PI	Refine Research Plan for Use of Atmospheric Laboratory for Application Stratospheric Chemistry Research	5/28/1992	NASA MSFC	\$65,000
NAS8-38609	5-33306	1993-405	Dr. Mike Newchurch, PI	Stratospheric Chemistry Research	8/1/1993-7/30/1995	ESSC MSFC	\$65,876
NAS8-38609	5-33307	1993-405	Dr. Mike Newchurch, PI	Stratospheric Chemistry Research	8/1/1993-7/30/1995	ESSC MSFC	\$19,124
NCC8-22	5-33432	N/A	Dr. Mike Newchurch, PI	ATLAS Atmospheric Chemistry	9/1/1993-9/30/1997	ESSC MSFC	\$116,343
DE-FG05-93ER61730	5-33374	1993-285	Dr. Mike Newchurch, PI	SAGE II Umkehr Ozone Comparisons	9/15/1993-9/14/1997	ESSC DOE	\$495,739
959894	5-33504	1981-712	Dr. Mike Newchurch, PI	Atmospheric Trace Molecular Spectroscopy	9/15/1993-9/14/1997	ESSC JPL	\$183,000
N/A	N/A	1994-455	Dr. Mike Newchurch, PI	ATLAS Stratospheric Chemistry Research	5/19/1994	NASA MSFC	\$85,000
N00014-94-1-G034	5-33679	1994-287	Dr. Mike Newchurch, PI	Chemical Modeling of Stratospheric Chlorine	9/30/1994-9/29/1997	ESSC NAVY/NRL	\$50,000
NAGW-4681	5-33946	1995-605	Dr. Mike Newchurch, PI	Validation of the Tropospheric Ozone Residual	9/1/1995-12/31/1995	ESSC NASA HQ	\$20,000
NAG1-1842	5-34494	1995-540	Dr. Mike Newchurch, PI	Station-to-Station Ozone Variability	7/1/1996-6/30/2000	ESSC LARC	\$238,928
NAG1-1898	5-34681	1996-578	Dr. Mike Newchurch, PI	SAGE II NO2	1/15/1997-2/4/2000	ESSC LARC	\$189,507
N/A	N/A	1997-006	Dr. Mike Newchurch, PI	Tropospheric Ozone Trends from TOMS	10/11/1996	NASA HQ ACMAP	\$19,000
NAG1-2026	5-20111	1997-501	Dr. Mike Newchurch, PI	Aerosol Retrievals from High Resolution Broadband Radiances	1/1/1998-12/31/2001	ESSC LARC	\$142,330
NAG5-7269	5-20186	1998-521	Dr. Mike Newchurch, PI	Derivation of Tropospheric Ozone Climatology & Trends	5/15/1998-5/14/2002	ESSC GSFC	\$259,246
N/A	N/A	1998-374	Dr. Christopher, PI Dr. Mike Newchurch, Co-I	Validation and Intercomparison of TOMS Aerosol Products Using Satellite and Ground Based Measurements	1998-2001	NASA ACMAP	\$240,000
NAG1-2204	5-20621	1998-375	Dr. Mike Newchurch, PI	Ozone Trends in SAGE, HALOE	7/1/1999-6/30/2002	ESSC LARC	\$275,066
40-RA-NR-108712	5-21272	2001-220	Dr. Mike Newchurch, PI	Ozone Profile Measurements	2/12/2001-12/30/2001	ESSC NOAA	\$15,278
NAG5-10965	5-21733	2001-316				ESSC	\$60,000

			Dr. Mike Newchurch, PI	Ozone Retrieval Errors Associated with Clouds	6/1/2001-5/31/2002	GSFC	
NAG5-11248	5-21762	2001-063	Dr. Mike Newchurch, PI	Optimal Aerosol Parameterization for Remote Sensing	8/15/2001-8/14/2004	ESSC GSFC	\$368,087
NCC8-200	745064	N/A	Dr. Mike Newchurch, PI	TOMS Science Team	8/24/2001-8/9/2005	ESSC MSFC	\$15,000
NAG5-11096	745087	2001-061	Dr. Mike Newchurch, PI	Critical Assessment of TOMS-derived Tropospheric Ozone	9/1/2001-8/31/2005	ESSC GSFC	\$326,258
NAG5-11100	745092	2000-420; 2004-535	Dr. Mike Newchurch, PI	Validating AIRS Ozone Observations	9/1/2001-8/31/2006	ESSC GSFC	\$350,918
RA1330-02-SE-0186	5-22070	2002-320	Dr. Mike Newchurch, PI	Ozonesondes at the Huntsville Station 2002	10/1/2001-9/30/2002	ESSC NOAA	\$15,278
582-2-48649	5-21976	2002-148	Dr. Mike Newchurch, PI	Analysis of Ozonesonde Data During TexAQS 2000	2/6/2002-8/31/2002	ESSC Texas Nat. Resource & Cons. Co	\$22,000
RA 1330-03-SE-0202	5-22250	2003-139	Dr. Mike Newchurch, PI	Ozonesondes at the Huntsville Station 2003	10/1/2002-9/30/2003	ESSC NOAA	\$15,278
2002006	675011	N/A	Dr. Mike Newchurch, PI	Cooperative Micro-Satellite Experiment	10/3/2002-3/31/2007	RSESC Radiance Technologies	\$665,880
N/A	N/A	N/A	Dr. Mike Newchurch, PI	Science Team Seed Funding for a Regional Atmospheric Profiling Center for Discovery, RAPCD	2001	NASA MSFC	\$15,000
NCC8-200	745078	2002-335	Dr. Mike Newchurch, PI	Atmospheric Chemistry	7/9/2003-8/9/2005	ESSC MSFC	\$76,110
RA133R-04-SE-0305	5-22656	2004-307	Dr. Mike Newchurch, PI	Ozonesondes at the Huntsville Station 2004	10/1/2003-9/30/2004	ESSC NOAA	\$15,278
2002006	745133	2004-037	Dr. Mike Newchurch, PI	Cooperative Micro-Satellite Experiment	2/1/2004-3/31/2007	ESSC Radiance Technologies	\$177,173
NNG04GM44G	745143	2005-323	Dr. Mike Newchurch, PI	Atmospheric Chemistry Studies Combining Satellite Observations	6/15/2004-6/14/2007	ESSC NASA HQ	\$92,907
RA 133R-05-SE-2640	745163	N/A	Dr. Mike Newchurch, PI	Ozonesondes at the Huntsville Station 2005	10/1/2004-9/30/2005	ESSC NASA HQ	\$15,278
TCN 05172	745174	2005-341	Dr. Mike Newchurch, Co-I	A Planning Initiative to Define Observational and Theoretical Mesoscale Phenomena	7/11/2005-11/30/2007	ESSC BATTELLE	\$58,083
NNM05AA22A	745009	2005-402	Dr. Mike Newchurch, PI	Tropospheric Ozone Lidar and Ozonesondes at Huntsville	8/10/2005-8/9/2009	ESSC NASA HQ	\$629,789
RA133R-06-SE-0773	745085	2006-189	Dr. Mike Newchurch, PI	Ozonesondes at the Huntsville Station 2006	10/1/2005-9/30/2006	ESSC NOAA	\$4,000
NNG06GH86G	745099	2005-356R	Dr. Mike Newchurch, PI	Implementation and Assessment of Ozone Profiling	5/1/2006-4/30/2009	ESSC NASA HQ	\$224,999
NA06NES4400008	745238	2006-238	Dr. Mike Newchurch, Co-PI	Spaced Remote Sensing of Air Quality	6/1/2006-5/31/2009	ESSC NOAA	\$1,800,000
NNX06AC57G	745229	2004-578R	Dr. Mike Newchurch, PI	Validation of OMI-Derived Tropospheric Ozone	7/1/2006-6/30/2009	ESSC NASA HQ	\$289,866
	745286	2007-387				ESSC	\$500,000

NA07NES42800 05			Dr. Mike Newchurch, Co-PI	Remote Sensing and Modeling of Air Quality	8/1/2007- 7/31/2009	NOAA	
NNM05AA22A	745275	2007-311	Dr. Mike Newchurch, PI	Experiment to Improve Air Quality Forecast	8/10/2007- 8/9/2009	ESSC MSFC	\$183,915
NA08NES44000 18	745336	2008-401	Dr. Mike Newchurch, Co-PI	UAHuntsville Proposal to support NOAA's Air Quality	8/1/2008- 7/31/2010	ESSC NOAA	\$325,172
			Dr. Mike Newchurch Co-PI	Lidar Ceilometer Upgrade to UAH Mobile Profiling System	3/9/2011- 10/1/2012	UAH ATS	\$36,254
			Dr. Mike Newchurch Co-PI	MRI: Acquisition of a Portable Doppler Wind and Aerosol Lidar for Research Enhancements in the Boundary Layer Meteorology, Atmospheric Chemistry, Aerosol Science and Cloud Physics.	8/1/2011- 8/1/2012	NSF under review	\$257,027
NA09NES44000 17	745367	2009- 375R	Dr. Mike Newchurch, PI	Satellite-Based Assessment of Regional Air Quality and Climate	8/1/2009- 7/31/2012	ESSC NOAA	\$290,000
NNM11AA01A	745471	2011-514	Dr. Mike Newchurch, PI	Tropospheric Ozone Lidar Measurements Initiative: UAH Activities	8/1/2011- 7/31/2012	ESSC NASA HQ	\$412,628
	745437		Dr. Mike Newchurch, PI	Tropospheric Ozone Lidar and Ozonesondes at RAPCD for EOS AURA Validation (2.9.1)	4/1/2011 to 3/31/2016	NASA	\$859k
			Dr. Mike Newchurch, PI	Tropospheric Ozone Lidar Measurements Initiative.: UAH Activities (2.9.2)	8/1/2011 to 7/31/2016	NASA	\$410k
			Dr. Mike Newchurch, PI	FY2014 Huntsville Ozone DIAL Scanner Hardware Upgrade	5/15/2014 to 9/15/2014	NASA	\$110k
			Dr. Mike Newchurch, PI	Tropospheric Ozone Lidar Network (TOLNet)	10/1/2014 to 9/30/2017	NASA	\$1.54M
			Dr. Mike Newchurch, PI	Tropospheric Ozone Lidar Network (TOLNet)	10/1/2017 to 9/30/2018	NASA	\$325k
Total Awarded Amount:							\$12.9M

STUDENTS SUPERVISED

Undergraduate Research Students

Year	Student's Name
1992-1995	Dawn Wallace Stripling
1993-1996	Colette Mitchell
1993-1995	Stephanie Willingham
1993-1995	Gabriel Collins
1993-1994	Ananta Gudipaty
1993-1994	Jennifer Bridges
1993	Garvin Dean
1994-1995	Laura Branch
1995-1996	Kimberly Cox
1995-1996	Lalitha Gudipaty
1996-2001	Leanne McAllister
1998-1999	Yook Mei Chong

2000-2001	Andayani Liauw
2001	Lawanna McCleave
2002	Hayley Cluck
2002-2003	Jennifer Williams
2002-2003	Lyndie Cyphers
2003-2004	Sharon Robers
2003-2005	Michael Robison
2004-2007	Holly Searcy
2006-2008	Danielle Nuding
2007-2009	Stephanie Long
2007-2009	Stephanie Horne
2007	Casey Swilley
2008-2009	Ragavendra Yarasi
2009	Sharon Conrad
2009-2013	Wes Cantrell
2013-2014	Nancy Pospelov
2014-2015	Clayton Craft
2015-2016	Nathan Lawrence
2015-2016	Michael Graham
2016-2017	Chris Tran
2016-pres.	David Mercier
2016-pres.	Ankur Shah

Graduate Students

Student	Degree & Major Field of Study	Title of Paper, Thesis, or Dissertation	Expected/Actual Date of Graduation
Karl Huston	ATS MS	Variations of stratospheric NO _x across the terminator	Returned to private sector
Eun Su Yang	ATS, PhD	Ozone trends from Arosa Dobson Umkehrs	Fall 00 Graduated
Mohammed Ayoub	ATS, MS	Ozonesonde measurements and analysis	2002 MS
Xiong Liu	ATS, PhD	TOMS Tropospheric Ozone Retrieval	Fall 2002 Graduated
Da Sun	ATS, PhD	TOMS Tropospheric Ozone Retrieval	2003 PhD
Jing Song	ATS	Tropospheric Ozone	2003 Transferred
Shi Kuang	ATS, PhD	Ozone Lidar Retrieval	2009 PhD
Judy Hopey	ATS, MS	MOUDI Aerosol Measurements	2006 MS
Alishia Holley	ATS, MS	Aerosol measurements	2005 PhD
Lucy Wang	ATS, PhD	Chem Satellite obs.	2009 PhD
Rochelle Williams	ATS, PhD	Atm Plume modeling	2009, left the program

Patrick Buckley	ATS, MS	Application of Cryogenic FTIR Spectroscopy for Monitoring Air Quality	2011 PhD
Pavan Ilipilla	ATS, MS	N/A	2007 Transferred
Guanyu Huang	ATS, PhD	LES modeling of tropospheric ozone lidar observations	2014 Graduated
Wes Cantrell	ATS, MS	N/A	Returned to private sector
Bo Wang	ATS, PhD	TBD	
Paula Tucker	ATS, MS	TBD	
Kristen Pozsonyi	ATS, PhD	TBD	

Committees

Student's Name	Degree & Major Field of Study	Title of Plan II Paper, Thesis or Dissertation	Term of Assignment	Role
J. Herwehe	ATS, PhD	Large Eddy Simulations	1998-2000	Comm. Member
Yuling Wu	ATS, PhD	Air Pollution Modeling	1998-2003	Comm. Member
Jinlong Li	ATS/GT, PhD	Atmospheric Chemistry	1997-2002	Comm. Member
Kurt Lightner	ATS/UMBC, PhD	FTIR Ozone Profiles	2001-2004	Comm. Member
Casey Calimaio	ESS, MS		2014-2017	Comm. Member
Aaron Kaulfus	ATS, PhD		2017-Present	Comm. Member
Megan McPeak	ATS, MS		2018-Present	Comm. Member

Postdoctoral Associates

Student's Name	Degree, Institution, Date	Field of Study	Term of Assignment
Jing Cao	Ph.D. Georgia Tech, 1994	Satellite remote sensing of stratospheric ozone	1994-1995
Jae Hwan Kim	Ph.D. U. Maryland, 1995	Satellite remote sensing of atmospheric ozone	1995-1996 NRC appointment
Shi Kuang	Ph.D. UAH 2009	Lidar observations of atmospheric ozone and aerosols	2009-present
Lihua Wang	Ph.D. UAH 2009	Mesoscale modeling of atmospheric chemistry and lightning effects	2009-present

HONORS AND AWARDS

- NASA Group Achievement Award for ARCTAS, 2009

- Oceanic and Atmospheric Research Outstanding Scientific Paper Award, 2007
- William T. Pecora Award, 2007
- NASA Group Achievement Award for the TOMS team, 2006
- NASA Group Achievement Award for the Intercontinental Chemical Transport Experiment North America Science Team, 2005
- Sigma Xi Researcher of the Year 2004, UAH Chapter
- Sigma Xi (Scientific research honor society) member
- Top-10 NASA Accomplishments for 2003; most popular AAAS and AGU web science story (2003): National Press Club announcement followed by >100 world-wide news stories: First Stage of Upper Atmospheric Ozone Recovery (2003).
- NASA Group Achievement Award (ATLAS-2 and ATLAS-3)
- NASA Group Achievement Award for ATLAS-2 mission, 1993
- NASA Group Achievement Award for ATLAS-3 mission, 1994

STUDENT AWARDS

- Danielle Nuding- awarded the Goldwater Scholarship, 2008
- Danielle Nuding- JPL Award- NASA Space Grant Summer Internship, 2007
- Stephanie Long became the first von Braun Scholarship recipient in UAH's College of Science

SERVICE

Major Departmental Service

- ATS620 Ph.D. qualifying exam questions
- ATS551 Ph.D. qualifying exam questions
- ATS520 Ph.D. qualifying exam questions
- Chief Architect- Strategic Planning Committee, 2000-2002
- ATS551 Ph.D. qualifying exam questions
- ATS520, ATS620, ATS 622 qualifying exam questions

University Service

- Regional Science Fair Judge, 2002-present
- State Science Fair Environ. Science Judge, 2002-present
- University Review Board, 2014-2016
- PTAC Member, 2003-2005, 2011-2012, 2013-2014
- Promotion Committee for Dr. Shuang Nan Zhang, 2006
- Alternate member of the College of Science Promotion and Tenure Committee, 2006
- Graduate Curriculum Committee Member, 2003-2005
- Undergrad. Science Scholarship Committee, 2004
- Publications Committee Member, 2000-2003
- University Building Committee Member, 2000-2003
- Chan Chair Search Committee Member, 2001

Professional Service

- TEMPO science team member, 2013-present
- GEO-CAPE science team member, 2009-present
- OMI Science Team member, 2006-present
- AIRS science team member, 2000-present

- NOAA-CREST Scientific Advisory Committee, 2003-present
- LaRC External Scientific Review Board, 2008
- SAGE science team member, 1994-2007
- TOMS science team member, 1997-2007
- IOC/SPARC Ozone Trends Assessment Panel member, 1998-1999, 2006
- POAM science team member, 1996-2006
- NASA Space Station Scientific Advisory Committee member, 1999-2003
- Investigator, ATMOS science team, 1992-2000
- USA Scientific Review of Republic of Korea Space Science Program member, 1998

Public Service Activities

- Baseball Coach, 1998-2001, 2005-present
- Boy Scout Leader 2002-present
- Alabama Science Fair Judge 2002-present
- Lecturer on Frontiers in Science careers and research, 2005-2012
- St. John's Catholic School Board Member 2006-2008
- Cub Scout Leader 2001-2008
- Soccer Coach, 1999-2006
- Scientific mentor, NCAR SOARS program, 1998