



Aims and Scope. *JGR: Atmospheres* publishes articles that advance and improve understanding of atmospheric properties and processes, including the interaction of the atmosphere with other components of the Earth system.

Editors: Steven J. Ghan (Editor-in-Chief) (steve.ghan@pnl.gov), (<http://orcid.org/0000-0001-8355-8699>), James H. Crawford, Ulrike Langematz, Zhanqing Li, Ruby Leung, Sara C. Pryor, Lynn Russell, Allison Steiner, Chidong Zhang (<http://orcid.org/0000-0001-9708-1561>).

Associate Editors: David Atkinson, Howard Barker, Mary C. Barth, Gufran Beig, Kristie A. Boering, William Brune, Christopher Cantrell, Simon A. Carn, Jen-Ping Chen, Ingrid Cnossen, Jack Dibb, Neil Donahue, Xiquan Dong, Gregory J. Frost, Joe Galewsky, Daniel Jacob, Diego Janches, Jonathan Jiang, Jens Hesselbjerg Christensen, Ben P. Kirtman, Pavlos Kollias, Jan Lastovicka, Robert Levy, Chuntao Liu, Guosheng Liu, Yangang Liu, Zhengzhao Luo, Hal Maring, Jens Oberheide, Laura Pan, Victor Pasko, Wouter Peters, Colin Price, Alexander Pszenny, Thomas Reddman, Jeffrey S. Reid, Alan Robock, Yinon Rudich, Steven Rutledge, S.K. Satheesh, Courtney Schumacher, David Simpson, Ivanka Stajner, Ina Tegen, Owen Toon, Tao Wang, Fuzhong Weng, Martin Wild, Zhenghui Xie, Robert J. Yokelson, Renyi Zhang, Tong Zhu, Francis Zwiers.

AGU Editorial Team. For assistance with submitted manuscripts, file specifications, or AGU publication policy please contact jgr-atmospheres@agu.org.

For submission instructions or to submit a manuscript visit: <http://jgr-atmospheres-submit.agu.org>.

The journal to which you are submitting your manuscript employs a plagiarism detection system. By submitting your manuscript to this journal you accept that your manuscript may be screened for plagiarism against previously published works.

JGR: Atmospheres accepts articles for Open Access publication. Please visit <http://olabout.wiley.com/WileyCDA/Section/id-406241.html> for further information about OnlineOpen.

Publication Charges. The publication charge income received for *JGR: Atmospheres* helps support rapid publication, allows more articles per volume, makes possible the low subscription rates, and supports many of AGU's scientific and outreach activities. Publication charge information can be found here: <http://publications.agu.org/author-resource-center/author-guide/publication-fees>.

To encourage papers to be written in a concise fashion, there is an excess length fee. For *JGR: Atmospheres* the fee is assessed only on the equivalent of more than 25 publication units. The excess length fee does not apply to review articles, and the editor may waive the fee on a limited number of concisely written papers that merit being longer. There is no charge for color in any format.

Copyright and Copying. Copyright © 2015, American Geophysical Union. All rights reserved. No part of this publication may be reproduced, stored or transmitted in any form or by any means without the prior permission in writing from the copyright holder. Authorization to copy items for

internal and personal use is granted by the copyright holder for libraries and other users registered with their local Reproduction.

Rights Organization (RRO), e.g. Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923, USA (www.copyright.com), provided the appropriate fee is paid directly to the RRO. This consent does not extend to other kinds of copying such as copying for general distribution, for advertising or promotional purposes, for creating new collective works or for resale. Special requests should be addressed to: publications@agu.org.

Disclaimer. The Publisher, American Geophysical Union, and Editors cannot be held responsible for errors or any consequences arising from the use of information contained in this journal; the views and opinions expressed do not necessarily reflect those of the Publisher, American Geophysical Union, and Editors, neither does the publication of advertisements constitute any endorsement by the Publisher, American Geophysical Union, and Editors of the products advertised.

Individual Subscriptions. Member subscriptions are available through members.agu.org or by contacting the AGU Member Service Center. The Service Center is open from 8:00 a.m. to 6:00 p.m. Eastern time: +1 202 462 6900, +1 800 966 2481; Fax: +1 202 328 0566; e-mail: service@agu.org. Questions about meetings or membership will be referred to the appropriate staff.

Publisher. *JGR: Atmospheres* is published on behalf of the American Geophysical Union by Wiley Periodicals, Inc., 111 River St., Hoboken, NJ, 07030-5774, +1 201 748 6000.

Journal Customer Services. For institutional subscription information, claims and any enquiry concerning your journal subscription please go to www.wileycustomerhelp.com/ask or contact your nearest office.

Americas: Email: cs-journals@wiley.com; Tel: +1 781 388 8598 or +1 800 835 6770 (toll free in the USA & Canada).

Europe, Middle East and Africa: Email: cs-journals@wiley.com; Tel: +44 (0) 1865 778315.

Asia Pacific: Email: cs-journals@wiley.com; Tel: +65 6511 8000.

Japan: For Japanese speaking support, Email: cs-japan@wiley.com; Tel: +65 6511 8010 or Tel (toll-free): 005 316 50 480.

Visit our Online Customer Help available in 7 languages at www.wileycustomerhelp.com/ask.

Production Editor. For assistance with post-acceptance articles and other production issues please contact JGRDprod@wiley.com.

Access to this journal is available free online within institutions in the developing world through the AGORA initiative with the FAO, the HINARI initiative with the WHO, the OARE initiative with UNEP, and the ARDI initiative with WIPO. For information, visit www.aginternetwork.org, www.who.int/hinari/en/, www.oaresciences.org, or www.wipo.int/ardi/en.

ISSN 2169-8996 (Online)

View this journal online at <http://jgr-atm.agu.org>.

Cover: In Hu et al. [DOI: [10.1002/2014JD022627](https://doi.org/10.1002/2014JD022627)], the KCMP tall tower (Minnesota, USA). Images inset show: (top) the NOAA WP-3D aircraft [image credit: Lynne Gratz]; (middle) annual US emissions of benzene and toluene as estimated by the NEI08 and RETRO bottom-up inventories and as derived in this work; (bottom) toluene mixing ratios over the contiguous US for the year 2011 as simulated by GEOS-Chem using the NEI08 emission inventory. See pp. 826–842.

The online article is the official version and may contain additional content not available in this print issue. To access the full article, including multimedia, enhanced figures, supporting information, and other nonprinted content, go to <http://wileyonlinelibrary.com/journal/jgrd>.

Climate and Dynamics

- 359** *Rakesh V and Prashant Goswami*
Impact of data assimilation on high-resolution rainfall forecasts: A spatial, seasonal, and category analysis (doi 10.1002/2014JD022383)
- 378** *Nick P. Bassill*
An analysis of the operational GFS simplified Arakawa Schubert parameterization within a WRF framework: A Hurricane Sandy (2012) long-term track forecast perspective (doi 10.1002/2014JD022211)
- 399** *J. A. France, V. L. Harvey, C. E. Randall, R. L. Collins, A. K. Smith, E. D. Peck and X. Fang*
A climatology of planetary wave-driven mesospheric inversion layers in the extratropical winter (doi 10.1002/2014JD022244)
- 414** *A. J. Ferraro, A. J. Charlton-Perez, and E. J. Highwood*
Stratospheric dynamics and midlatitude jets under geoengineering with space mirrors and sulfate and titania aerosols (doi 10.1002/2014JD022734)
- 430** *XiaoJing Jia, SuWang, Hai Lin and Qing Bao*
A connection between the tropical Pacific Ocean and the winter climate in the Asian-Pacific region (doi 10.1002/2014JD022324)
- 449** *Shiori Kunoki, Atsuyoshi Manda, Yasu-Masa Kodama, Satoshi Iizuka, Kazutoshi Sato, Ibnu Fathrio, Taku Mitsui, Hiromu Seko, Qoosaku Moteki, Shoshiro Minobe and Yoshihiro Tachibana*
Oceanic influence on the Baiu frontal zone in the East China Sea (doi 10.1002/2014JD022234)
- 464** *Zheng-Hong Tan, Yi-Ping Zhang, Xiao-Bao Deng, Qing-Hai Song, Wen-Jie Liu, Yun Deng, Jian-Wei Tang, Zhi-Yong Liao, Jun-Fu Zhao, Liang Song, and Lian-Yan Yang*
Interannual and seasonal variability of water use efficiency in a tropical rainforest: Results from a 9 year eddy flux time series (doi 10.1002/2014JD022535)
- 480** *Patrick T. Brown, Wenhong Li, and Shang-Ping Xie*
Regions of significant influence on unforced global mean surface air temperature variability in climate models (doi 10.1002/2014JD022576)
- 495** *Hiteshi Shastri, Supantha Paul, Subimal Ghosh and Subhankar Karmakar*
Impacts of urbanization on Indian summer monsoon rainfall extremes (doi 10.1002/2014JD022061)
- 517** *Kyung-On Boo, Ben B. Booth, Young-Hwa Byun, Johan Lee, ChunHo Cho, Sungbo Shim and Kyun-Tae Kim*
Influence of aerosols in multidecadal SST variability simulations over the North Pacific (doi 10.1002/2014JD021933)
- 532** *Qianru Wu and Qi Hu*
Atmospheric circulation processes contributing to a multidecadal variation in reconstructed and modeled Indian monsoon precipitation (doi 10.1002/2014JD022499)
- 552** *Christof Lüpkes and Vladimir M. Gryanik*
A stability-dependent parametrization of transfer coefficients for momentum and heat over polar sea ice to be used in climate models (doi 10.1002/2014JD022418)
- 582** *T. Chronis, K. Cummins, R. Said, W. Koshak, E. McCaul, E. R. Williams, G. T. Stano and M. Grant*
Climatological diurnal variation of negative CG lightning peak current over the continental United States (doi 10.1002/2014JD022547)
- 590** *Zhenduo Zhu and Ping Zhu*
Sensitivities of eyewall replacement cycle to model physics, vortex structure, and background winds in numerical simulations of tropical cyclones* (doi 10.1002/2014JD022056)
- *This article is a companion to Zhu and Zhu [2014] doi:10.1002/2014JD021899**
- 623** *S. Pal, M. Lopez, M. Schmidt, M. Ramonet, F. Gibert, I. Xueref-Remy and P. Ciais*
Investigation of the atmospheric boundary layer depth variability and its impact on the ²²²Rn concentration at a rural site in France (doi 10.1002/2014JD022322)
- 644** *Junhong Lee, Hyeyum Hailey Shin, Song-You Hong, Pedro A. Jiménez, Jimmy Dudhia and Jinkyu Hong*
Impacts of subgrid-scale orography parameterization on simulated surface layer wind and monsoonal precipitation in the high-resolution WRF model (doi 10.1002/2014JD022747)

Aerosol and Clouds

- 654** *Zhijin Li, Sha Feng, Yangang Liu, Wuyin Lin, Minghua Zhang, Tami Toto, Andrew M. Vogelmann and Satoshi Endo*
Development of fine-resolution analyses and expanded large-scale forcing properties: 1. Methodology and evaluation* (doi 10.1002/2014JD022245)
***This article is part of a Special Section–Fast Physics in Climate Models: Parameterization, Evaluation and Observation**
***This article is a companion to *Fheng et al.* [2014] doi:10.1002/2014JD022254**
- 667** *Sha Feng, Zhijin Li, Yangang Liu, Wuyin Lin, Minghua Zhang, Tami Toto, Andrew M. Vogelmann and Satoshi Endo*
Development of fine-resolution analyses and expanded large-scale forcing properties: 2. Scale awareness and application to single-column model experiments* (doi 10.1002/2014JD022254)
***This article is part of a Special Section–Fast Physics in Climate Models: Parameterization, Evaluation and Observation**
***This article is a companion to *Li et al.* [2014] doi:10.1002/2014JD022245**
- 678** *C. E. Jordan, A. A. P. Pszenny, W. C. Keene, O. R. Cooper, B. Deegan, J. Maben, M. Routhier, R. Sander and A. H. Young*
Origins of aerosol chlorine during winter over north central Colorado, USA* (doi 10.1002/2014JD022294)
***This article is part of a Special Section–Nitrogen, Aerosol Composition and Halogens Over a Tall Tower (NACHTT1)**
- 695** *Stefan Wacker, Julian Gröbner, Christoph Zysset, Laurin Diener, Panagiotis Tzoumanikas, Andreas Kazantzidis, Laurent Vuilleumier, Reto Stöckli, Stephan Nyeki and Niklaus Kämpfer*
Cloud observations in Switzerland using hemispherical sky cameras (doi 10.1002/2014JD022643)
- 708** *Luwen Chen, Weitao Lu, Yijun Zhang and Daohong Wang*
Optical progression characteristics of an interesting natural downward bipolar lightning flash (doi 10.1002/2014JD022463)
- ## Composition and Chemistry
- 716** *F. Ploeger, M. Riese, F. Haenel, P. Konopka, R. Müller, and G. Stiller*
Variability of stratospheric mean age of air and of the local effects of residual circulation and eddy mixing (doi 10.1002/2014JD022468)
- 734** *Lesley E. Ott, Steven Pawson, George J. Collatz, Watson W. Gregg, Dimitris Menemenlis, Holger Brix, Cecile S. Rousseaux, Kevin W. Bowman, Junjie Liu, Annmarie Eldering, Michael R. Gunson, and Stephan R. Kawa*
Assessing the magnitude of CO₂ flux uncertainty in atmospheric CO₂ records using products from NASA's Carbon Monitoring Flux Pilot Project (doi 10.1002/2014JD022411)
- 766** *Deepika Bhattu and S. N. Tripathi*
CCN closure study: Effects of aerosol chemical composition and mixing state (doi 10.1002/2014JD021978)
- 784** *Harald E. Rieder, Arlene M. Fiore, Larry W. Horowitz, and Vaishali Naik*
Projecting policy-relevant metrics for high summertime ozone pollution events over the eastern United States due to climate and emission changes during the 21st century (doi 10.1002/2014JD022303)
- 801** *Lei Hu, Stephen A. Montzka, John B. Miller, Aryln E. Andrews, Scott J. Lehman, Benjamin R. Miller, Kirk Thoning, Colm Sweeney, Huilin Chen, David S. Godwin, Kenneth Masarie, Lori Bruhwiler, Marc L. Fischer, Sebastien C. Biraud, Margaret S. Torn, Marikate Mountain, Thomas Nehrkorn, Janusz Eluszkiewicz, Scot Miller, Roland R. Draxler, Ariel F. Stein, Bradley D. Hall, James W. Elkins, and Pieter P. Tans*
U.S. emissions of HFC-134a derived for 2008–2012 from an extensive flask-air sampling network (doi 10.1002/2014JD022617)
- 826** *Lu Hu, Dylan B. Millet, Munkhbayar Baasandorj, Timothy J. Griffis, Katherine R. Travis, Christopher W. Tessum, Julian D. Marshall, Wesley F. Reinhart, Tomas Mikoviny, Markus Müller, Armin Wisthaler, Martin Graus, Carsten Warneke, and Joost de Gouw*
Emissions of C₆–C₈ aromatic compounds in the United States: Constraints from tall tower and aircraft measurements (doi 10.1002/2014JD022627)
- 843** *M. J. Schwartz, G. L. Manney, M. I. Hegglin, N. J. Livesey, M. L. Santee, and W. H. Daffer*
Climatology and variability of trace gases in extratropical double-tropopause regions from MLS, HIRDLS, and ACE-FTS measurements (doi 10.1002/2014JD021964)
- 868** *Katsuyuki Kuchiki, Teruo Aoki, Masashi Niwano, Sumito Matoba, Yuji Kodama, and Kouji Adachi*
Elemental carbon, organic carbon, and dust concentrations in snow measured with thermal optical and gravimetric methods: Variations during the 2007–2013 winters at Sapporo, Japan (doi 10.1002/2014JD022144)