

# lorenzo m. polvani

**Department of Applied Physics and Applied Mathematics &  
Department of Earth and Environmental Sciences**

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## Present Position

*Maurice Ewing and J. Lamar Worzel Professor of Geophysics* in the Department of Applied Physics and Applied Mathematics, Professor of Earth & Environmental Sciences, and Senior Research Scientist at the Lamont Doherty-Earth Observatory, Columbia University.

## Previous Positions

- Professor of Applied Mathematics, Columbia University, 2000-2020
- Associate Professor of Applied Mathematics, Columbia University, 1995-2000
- Assistant Professor of Applied Mathematics, Columbia University, 1990-1995
- Instructor in Applied Mathematics [non-tenure track], M.I.T., 1988-1990

## Education

- 1988 Ph.D., MIT/WHOI Joint Program in Physical Oceanography  
Thesis Title: *Geostrophic Vortex Dynamics*  
Thesis Advisors: N.J. Zabusky and G.R. Flierl
- 1982 M.Sc., McGill University, Physics
- 1981 B.Sc., McGill University, with First Class Honours in Physics

## Honors & Awards

- 2022 *Elected Fellow*, American Association for the Advancement of Science (AAAS)
- 2019 *Elected Fellow*, American Geophysical Union (AGU)
- 2016 *ATOC Distinguished Lecturer*, University of Colorado
- 2015 *Elected Fellow*, American Meteorological Society
- 2015 *Alliance Visiting Professor*, L'Ecole Polytechnique, Palaiseau (France)
- 2012 *Best Teacher of the Year*, Dept. of Earth and Environmental Sciences, Columbia
- 2008 *Great Teacher Award*, Society of Columbia Graduates
- 1997 *Distinguished Faculty Teaching Award*, Columbia SEAS Alumni Association
- 1994 NSF National *Young Investigator Award*
- 1987 *Fellow*, GTP Summer School on Geophysical and Astrophysical Turbulence, NCAR
- 1984 *Fellow*, Geophysical Fluid Dynamics Summer School, Woods Hole, MA
- 1983 *Jule G. Charney Award*, Massachusetts Institute of Technology
- 1981 Natural Science and Engineering Research Council of Canada Postgraduate Scholarship
- 1981 *Anne Molson Gold Medal* for Mathematics and Natural Philosophy, McGill University
- 1980-81 *J.W. McConnell Award*, McGill University
- 1979-81 *University Scholar*, McGill University

**Professional Activities**

- Co-author, Chapter 5, 2026 WMO Scientific Assessment of Ozone Depletion; and contributing author, Chapter 5, 2022 WMO Assessment; and review editor, Chapter 5, 2018 WMO Assessment; and co-author, Chapter 4, 2014 WMO Assessment; and co-author, Chapter 3, 2006 WMO Assessment
- University Corporation for Atmospheric Research (UCAR), Member Representative for Columbia University, 2003-present
- Member of the Committee on Polar Meteorology and Oceanography American Meteorological Society, 2019–2026
- Member of the Scientific Steering Committee of the Community Earth System Model (CESM) Project, 2014-2020
- Member of the International Commission on the Middle Atmosphere (ICMA), 2011-2019
- Co-Chair of the CESM Whole Atmosphere Working Group, 2010-2017
- Chair of the Committee on the Middle Atmosphere, American Meteorological Society, 2010–2012
- Chair of the Committee on Atmospheric and Oceanic Waves and Stability, American Meteorological Society, 1995–1998

**Conference and Program Committees**

- Member of the Organizing Committee, 16th Conference on Polar Meteorology and Oceanography, Madison, WI, August 2022
- Member of the Organizing Committee, 15th Conference on Polar Meteorology and Oceanography, Boulder, CO, May 2019
- Convener of the AGU Chapman Conference on “The Width of the Tropics”, Santa Fe, NM, 2015
- Chair of the Organizing Committee, 18th Conference on the Middle Atmosphere, Newport, RI, 2013
- Member of the Organizing Committee, 16th Conference on the Middle Atmosphere, Seattle, WA, January 2011
- Chair of the “PlumbFest 2008” Symposium, Columbia University, New York, NY, October 2008
- Member of the Organizing Committee, 25th IUGG Conference on Mathematical Geophysics, New York, NY, June 2004
- Member of the Organizing Committee, 2002 Japanese-American Frontiers of Science Symposium, National Academy of Sciences, Irvine, CA, December 2002.
- Member of the Organizing Committee, Chapman Conference on the North Atlantic Oscillation, Lisbon, Portugal, December 2000
- Chair of the Organizing Committee, 12th Conference on Atmospheric and Oceanic Fluid Dynamics, Columbia University, June 1999

**Visiting Positions and Appointments**

- Affiliate Scientist, National Center for Atmospheric Research (CGD & ACD), 2004-2023
- Alliance Visiting Professor, L'École Polytechnique, Palaiseau, April-May 2015
- Visiting Scholar, Courant Institute for Mathematical Sciences, New York University, January to June 2006
- Visiting Scientist, NOAA/Geophysical Fluid Dynamics Laboratory, Princeton NJ, July 2001 to June 2002
- Visiting Scientist, Climate and Global Dynamics Division, NCAR, Summer 1994
- Staff Member, Geophysical Fluid Dynamics Summer School, Woods Hole, MA, Summer 1992

**Courses taught, 1990 – 2024, at Columbia University**

- APAM E1601 – *Introduction to Computational Physics and Mathematics*
- APMA E3101 – *Applied Mathematics I – Linear Algebra*
- APMA E3102 – *Applied Mathematics II – Differential Equations*
- APMA E4200 – *Partial Differential Equations*
- APMA E4204 – *Functions of a Complex Variable*
- APMA E6301 – *Analytical Methods for PDEs*
- APMA E6901 – *Special Topics in Applied Mathematics*
- APMA E8308 – *Asymptotic Methods in Applied Mathematics*
- APAM E9810 – *Mathematical Earth Science Seminar*
- APAM E4210 – *Geophysical Fluid Dynamics*
- APAM E9815 – *Geophysical Fluid Dynamics Seminar*
- EESC GU4008 – *Introduction to Atmospheric Science*
- EESC GR9910 – *Seminar in Atmospheric Science*

**Undergraduate Research Students Advised**

- Serge Voronin, 2005–2007: went on to graduate school at Princeton University
- Damian. Ancukiewicz, 2007–2008: went on to graduate school at UCSD
- Ana Lobo, 2014–2015: went on to graduate school at Caltech
- Sylvia Wang, 2024-2025
- Benjamin Goodman, 2024-2026: now working with ATT

**Graduate Students Advised**

James Cho	Thesis title: <i>Geophysical turbulence in shallow water with applications to planetary atmospheres</i> . Graduation date: September 1996
Mark DiBattista	Thesis title: <i>Vortex pairs in spherical geometry as models of atmospheric blocking</i> . Graduation date: December 1996
Allen Kuo	Thesis title: <i>Nonlinear geostrophic adjustment and wave-vortex interactions in rotating shallow water</i> . Graduation date: May 1999
Leonard Rivier	Thesis title: <i>Jet formation and equatorial superrotation in Jupiter's atmosphere: Numerical modeling using a new efficient parallel code</i> . Graduation date: August 2001
Matthew Wittman	Thesis title: <i>Stratospheric influences on baroclinic lifecycles</i> . Graduation date: August 2006
Clara Orbe	Thesis title: <i>Tracer-independent approaches to stratosphere-troposphere exchange and tropospheric air mass composition</i> . Graduation date: April 2013
Neil Tandon	Thesis title: <i>What is driving changes in the tropospheric circulation? New insights from simplified models</i> . Graduation date: May 2013
Bernard Lipat	Thesis title: <i>Quantifying and understanding the linkages between clouds and the general circulation of the atmosphere</i> . Graduation date: May 2018.
Mark England	Thesis title: <i>Understanding observed and projected climate changes in the Antarctic, and their global impacts</i> . Graduation date: May 2019.
Jessie Oehrlein	Thesis title: <i>Sudden stratospheric warmings and their impact on Northern hemisphere winter climate</i> . Graduation date: April 2021.
Tyler Janoski	Thesis title: <i>Exploring the timescales and mechanisms of polar amplification</i> . Graduation date: October 2023.
Ivan Mitevski	Thesis title: <i>Asymmetric and non-monotonic response of the climate system to idealized CO<sub>2</sub> forcing</i> . Graduation date: July 2023.
Paulina Czarnecki	Thesis title: <i>Computational and theoretical approaches to spectral challenges in atmospheric radiation</i> . Graduation date: August 2025
Dana Raiter	Advised since Spring 2021; expected to graduate Summer 2027
You-Ting Wu	Advised since Spring 2024; expected to graduate Summer 2029
Joseph Kelley	Advised since Fall 2025; expected to graduate Summer 2030

**Post-doctoral Fellows Advised**

Gavin Esler	1996–1998	now Professor at University College London
Richard Scott	2001–2003	now Professor at St. Andrews University
Andrew Charlton	2004–2006	now Professor at the University of Reading
Edwin Gerber	2006–2008	now Professor at New York University
Seok-woo Son	2006–2008	now Professor at Seoul National University
Sarah Kang	2009–2011	now Director of the Max Planck Institute in Hamburg
Shuguang Wang	2009–2012	now Professor at Nanjing University
Jimmy Booth	2010–2013	now Professor at the City University of New York
Harald Rieder	2011–2013	now Professor at BOKU University in Vienna, Austria
Elizabeth Barnes	2012–2013	now Professor at Colorado State University
Karen Smith	2011–2017	now Professor at the University of Toronto
Kevin Grise	2012–2014	now Professor at the University of Virginia
Abraham Solomon	2014–2016	now Mathematics Teacher at the YDE School in Brooklyn, NY
Gabriel Chiodo	2014–2018	now Ramon y Cajal Fellow, Instituto de Geociencias in Madrid
Aditi Sheshadri	2015–2017	now Professor at Stanford University
Katinka Bellomo	2015–2017	now Professor at the University of Padua
Antara Banerjee	2015–2018	now Senior Data Scientist with McKinsey & Co in Denver
Rei Chemke	2017–2020	now Professor at the Weizmann Institute, Israel
Kevin DallaSanta	2019–2000	now Quantitative Strategist at Virtu Financial in New York
Bithi De	2019–2022	now Research Scientist at Purdue University
Yu-Chiao Liang	2020–2021	now Professor at National Taiwan University
Yue Dong	2022–2023	now Professor at UCLA
Simon Lee	2021–2024	now Professor at St. Andrews University
Zachary McGraw	2021–2025	now Postdoctoral Researcher at the University of Vienna
Sean Cohen	2024–	(current)
Joonsuk Kang	2025–	(current)
Rachel Wu	2026–	(current)

**Academic Service**

- Vice-chair, Department of Applied Physics and Applied Mathematics (2019-present)
- Faculty Advisor for the Applied Mathematics Graduate & Undergraduate Programs
- Faculty Advisor, TBII (Engineering Honor Society), Columbia Chapter, 2001-2012
- Faculty Advisor, Engineers Without Borders, Columbia Chapter, 2006-2009
- Faculty representative in the University Senate (2 rounds of three years)
- Innumerable other committees, surely not worth my listing or your reading...

**Membership in Professional Societies**

- American Meteorological Society
- American Physical Society
- European Geosciences Union
- American Geophysical Union
- American Astronomical Society
- Society for Industrial & Applied Mathematics

**Conference attendance, with research presentations (since 2007, only)**

- AGU General Assembly, San Francisco, CA (December 2008) [INVITED TALK]
- EGU Union General Assembly, Vienna, Austria (April 2009)
- AGU General Assembly, San Francisco, CA (December 2009)
- EGU General Assembly, Vienna, Austria (April 2010) [INVITED TALK]
- The International Polar Year Conference, Oslo, Norway (June 2010) [INVITED TALK]
- The 2nd SPARC DynVar Workshop, Boulder, CO (November 2010)
- AGU General Assembly, San Francisco, CA (December 2010) [INVITED TALK]
- 16th AMS Conference on the Middle Atmosphere, Seattle, WA (January 2011)
- 18th AMS Conference on Atmospheric and Oceanic Fluid Dynamics, Spokane, WA (June 2011)
- 16th Annual CESM Workshop, Breckenridge, CO (June 2011) [INVITED TALK]
- WCRP Open Science Conference, Denver CO (October 2011) [INVITED TALK]
- AGU General Assembly, San Francisco, CA (December 2011)
- EGU General Assembly, Vienna, Austria (April 2012)
- 17th Annual CESM Workshop, Breckenridge, CO (June 2012)
- Scientific Committee on Antarctic Research 5th Open Science Conference, Portland, OR (July 2012)
- Quadrennial Ozone Symposium, Toronto, Canada (August 2012)
- AGU General Assembly, San Francisco, CA (December 2012)
- The MIT Southern Ocean Workshop, Cambridge, MA (January 2013) [INVITED TALK]
- EGU General Assembly, Vienna, Austria (April 2013)
- The 3rd SPARC DynVar Workshop, Reading, UK (April 2013)
- 17th AMS Conference on the Middle Atmosphere, Newport, RI (June 2013)
- Davos Atmosphere and Cryosphere Assembly, Davos, CH (July 2013) [INVITED TALK]
- AGU General Assembly, San Francisco, CA (December 2013) [INVITED TALK]
- “Connecting the Tropics to Polar Regions” Conference, NY, NY (June 2014) [INVITED TALK]
- AGU General Assembly, San Francisco, CA (December 2014)
- 18th AMS Conference on the Middle Atmosphere, Phoenix, AZ (January 2015)
- Chapman Conference on “The Width of the Tropics”, Santa Fe, NM (July 2015)
- AGU General Assembly, San Francisco, CA (December 2015)
- EGU General Assembly, Vienna, Austria (April 2016)
- 6th International HEPPA-SOLARIS Meeting, Helsinki (June, 2016)
- UW Friday Harbor Summer Workshop, Seattle, WA (September 2016) [INVITED TALK]
- WCRP Model Hierarchies Workshop, Princeton, NJ (November 2016)

- AGU General Assembly, San Francisco, CA (December 2016)
- EGU General Assembly, Vienna, Austria (April 2017) [INVITED TALK]
- AGCI Workshop on Polar Amplification, Aspen, CO (June 2017) [INVITED TALK]
- AGU General Assembly, New Orleans, CA (December 2017)
- EGU General Assembly, Vienna, Austria (April 2018) [INVITED TALK]
- SPARC 6th General Assembly, Kyoto, Japan (October 2018) [INVITED TALK]
- AGU General Assembly, Washington, DC (December 2018)
- 18th AMS Conference on the Middle Atmosphere, Phoenix, AZ (January 2019)
- EGU General Assembly, Vienna, Austria (April 2019)
- 15th AMS Conference on Polar Meteorology and Oceanography, Boulder, CO (May, 2019)
- AGU General Assembly, San Francisco, CA (December 2019) [INVITED TALK]
- EGU General Assembly (virtual, May 2020)
- AGU General Assembly (virtual, December 2020)
- EGU General Assembly (virtual, April/May 2021)
- AGU General Assembly, New Orleans LA (hybrid, December 2021)
- EGU General Assembly (virtual, April/May 2021)
- AGU General Assembly, New Orleans LA (hybrid, December 2021)
- US CLIVAR Pattern Effect Workshop, Boulder, CO (May 2022)
- CFMIP Meeting On Clouds, Precipitation and Climate Sensitivity, Seattle WA (July 2022)
- 17th AMS Conference on Polar Meteorology and Oceanography, Madison, WI (August 2022)
- SPARC General Assembly, Boulder, CO (October 2022)
- AGU General Assembly, Chicago, IL (December 2022)
- 21st AMS Conference on Middle Atmosphere, Denver, CO (January, 2023)
- EGU General Assembly, Vienna, Austria (April 2023)
- 104th Annual Meeting of the AMS, Baltimore, MD (January 2024)
- US CLIVAR Workshop on Confronting Models with Observations, Boulder, CO (March 2024)
- EGU General Assembly, Vienna, Austria (April 2024)
- CFMIP Meeting on Clouds, Precipitation, Circulation and Clim. Sens., Boston, MA (June 2024)
- 22th AMS Conference on the Middle Atmosphere, Burlington, VT (June 2024)
- Quadrennial Ozone Symposium, Boulder, CO (July 2024) [INVITED TALK]
- AGU General Assembly, Washington, DC (December 2024)
- EGU General Assembly, Vienna, Austria (April 2025)
- 18th AMS Conference on Polar Meteorology and Oceanography, Denver, CO (May 2025)
- AGU General Assembly, New Orleans, LA (December 2025)
- EGU General Assembly, Vienna, Austria (May 2026) [INVITED TALK]

**1. Peer-reviewed journal articles:****2026**

- 276 M. Sigmond and L.M. Polvani, 2026: Large direct and indirect impacts of ozone-depleting substances on past Southern Hemisphere atmosphere-ocean trends, to appear in *npj Clim. Atmos. Sci.*
- 275 Y.-C. Liang, L.M. Polvani, M. Previdi, Y. Dong, Y.-T. Wu, M.R. England and S.M. Griffiths, 2026: **The importance of non-CO<sub>2</sub> greenhouse gases to Arctic warming and sea ice loss**, *Geophys. Res. Lett.*, **53**, e2026GL122867
- 274 S. Cohen, R. Pincus and L.M. Polvani, 2026: **Stratospheric cooling and amplification of radiative forcing with rising carbon dioxide**, *Nature Geoscience* **19**, 507–512
- 273 M. Friedel, G. Chiodo, K. Weber, L.M. Polvani, J.S. Daniel, and 9 additional co-authors, 2026: **Confirming the substantial contribution of ozone-depleting halocarbon emissions to global warming during the second half of 20th century**, *npj Clim. Atmos. Sci.* **9**, 106
- 272 M.E. Menzel, C. Orbe and L.M. Polvani, 2026: **Distinguishing the direct radiative, surface warming, and ozone mediated contributions to the acceleration of the Brewer-Dobson circulation under abrupt CO<sub>2</sub> forcing**, *J. Climate* **39**, 2401–2415
- 271 L. Roach and L.M. Polvani, 2026: **Persistent Antarctic sea ice biases in CMIP6 models in spite of the recent decade-long sharp decline**, *J. Climate* **39**, 1669–1679
- 270 Z. He, E. Tejedor, J.E. Smerdon, M. Vuille, L.M. Polvani, R. Seager, I. Sugiura, 2026: **Comparison of global climatic responses to large tropical volcanic eruptions over the Last Millennium in paleoclimatic reconstructions and model simulations**, *J. Climate* **39**, 1295–1313
- 269 S.H. Lee and L.M. Polvani, 2026: **Increasing frequency and persistence of the summertime Greenland high regime not captured by a seasonal prediction model very large ensemble**, *Geophys. Res. Lett.* **53**, e2025GL119421

**2025**

- 268 P. Czarnecki, L.M. Polvani, and R. Pincus, 2025: **Analytical models of instantaneous radiative forcing across opacity regimes**, *J. Climate* **13**, 1610651
- 267 H.E. Rieder, J. Kult-Herdin, L.M. Polvani, S. Solomon and A. Kuchar, 2025: **Are springtime Arctic ozone concentrations predictable from wintertime conditions?**, submitted to *Frontiers in Earth Science* **13**, 1610651
- 266 D. Raiter, Z. McGraw and L.M. Polvani: **Non-linear and distinct responses of temperature and precipitation to volcanic eruptions with stratospheric sulfur injection from 5 to 160 Tg**, *Geophys. Res. Lett.* **52**, e2025GL116372
265. I. Mitevski, L.M. Polvani, H. He, G. Vecchi, C. Orbe, B. Soden, and R.L. Miller, 2025: **State dependence of CO<sub>2</sub> effective radiative forcing from 1/16× to 16×CO<sub>2</sub>**, *J. Clim.* **38**, 5323–5333
- 264 Z. McGraw and L.M. Polvani, 2025: **Do climate models support claims of volcanic global catastrophes?**, *Geophys. Res. Lett.* **52**, e2025GL117611

- 263 Isla R. Simpson and 16 co-authors (including L.M. Polvani), 2025: **The path toward vertical grid options for the Community Atmosphere Model version 7: The impact of vertical resolution on the QBO and tropical waves**, *J. Adv. Model Earth. Sys.* **17**, e2025MS004957
- 262 M.R. England, L.M. Polvani, J. Screen, and A.C.Y. Chan, 2025: **Minimal Arctic sea ice loss in the last 20 years, consistent with internal climate variability**, *Geophys. Res. Lett.* **52**, e2025GL116175
261. Michael Previdi and L.M. Polvani, 2025: **Effective heat capacity and its role in Arctic amplification**, *Geophys. Res. Lett.* **52**, e2025GL115061
260. T. Janoski, I.Mitevski, R.J. Kramer, M. Previdi, and L.M. Polvani, 2025: **ClimKern: A new Python package and kernel repository for calculating radiative feedbacks**, *Geosci. Model Dev.* **18**, 3065–3079
259. I. Mitevski, S.H. Lee, G. Vecchi, C. Orbe and L.M. Polvani: **More Positive and Less Variable North Atlantic Oscillation at High CO<sub>2</sub> forcing**, *npj Clim. Atmos. Sci.* **8**, 171
258. Y. Dong, L.M. Polvani, Y.-T. Hwang and M.R. England, 2025: **Stratospheric ozone depletion has contributed to the recent tropical La Niña-like cooling pattern**, *npj Clim. Atmos. Sci.* **8**, 150
257. N. Calvo, R.R. Garcia, G. Chiodo, D.R. Marsh and L. M. Polvani, 2025: **On the timescales of the response of the Brewer-Dobson circulation to an abrupt quadrupling of CO<sub>2</sub>**, *J. Geophys. Res.* **130**, e2024JD041780
256. Y.-C. Liang, O. Miyawaki, T. A. Shaw , I. Mitevski, L.M. Polvani and Y.-T. Hwang, 2025: **Linking Radiative-Advective Equilibrium Regime Transition to Arctic Amplification**, *Geophys. Res. Lett.* **52**, e2024GL113417
255. Z. McGraw, L.M. Polvani, Blaž Gasparini, E. Van de Koot and A. Voigt, 2025: **The Cloud Radiative Response to Surface Warming Weakens Hydrological Sensitivity**, *Geophys. Res. Lett.* **52**, e2024GL112368
- 2024**
254. X. Zhang, D.W. Waugh, I. Mitevski, C. Orbe and L.M. Polvani, 2024: **Decreased Northern Hemisphere precipitation from consecutive CO<sub>2</sub> doublings is associated with significant AMOC weakening**, *Environ. Res. Climate* **3**, 041005
253. E. Tejedor, L.M. Polvani, N.J. Steiger, M. Vuille and J.E. Smerdon, 2024: **No evidence of winter warming in Eurasia following large, low-latitude volcanic eruptions during the Last Millennium**, *J. Climate* **37**, 5653–5673
252. S. Lee and L.M. Polvani, 2024: **Large model biases in the Pacific centre of the Northern Annular Mode due to exaggerated variability of the Aleutian Low**, *Quart. J. Roy. Meteor. Soc.* **150**, 4478–4497
251. I. Mitevski, R. Chemke, C. Orbe and L.M. Polvani, 2024: **Southern Hemisphere winter storm tracks respond differently to low and high CO<sub>2</sub> forcings**, *J. Climate* **37**, 5355–5372
250. Z. McGraw and L.M. Polvani, 2024: **How Volcanic Aerosols Globally Inhibit Precipitation**, *Geophys. Res. Lett.* **51**, e2023GL107930

249. Y.-T. Wu, Y.-C. Liang, M. Previdi, L.M. Polvani, M.R. England, M. Sigmond and M.-H. Luo, 2024: **Stronger Arctic Amplification from Anthropogenic Aerosols than from Greenhouse Gases**, *npj Clim. Atmos. Sci.* **7**, 142
248. Z. McGraw, K. DallaSanta, L.M. Polvani, K. Tsigaridis, C. Orbe and S.E. Bauer, 2024: **Severe global cooling after volcanic super-eruptions? The answer hinges on unknown aerosol size**, *J. Climate* **37**, 1449–1464
247. Y.-C. Liang, Y.-O. Kwon, C. Frankignoul, G. Gastineau, K.L. Smith, L.M. Polvani, L. Sun, Y. Peings, C. Deser, R. Zhang and J. Screen, 2024: **The weakening of the stratospheric polar vortex and the subsequent surface impacts as consequences to Arctic sea ice loss**, *J. Climate* **37**, 309–333

### 2023

- 246 Y. Dong, L.M. Polvani and D.B. Bonan, 2023: **Recent multi-decadal Southern Ocean surface cooling unlikely caused by Southern Annular Mode trends**, *Geophys. Res. Lett.* **50**, e2023GL106142
- 245 A. Peccia, Y. Moussallam, T. Plank, K. DallaSanta, L.M. Polvani, A. Burgisser, J. Larsen and J. Schaefer, 2023: **A new multi-method assessment of stratospheric sulfur load from the Okmok II caldera-forming eruption of 43 BCE**, *Geophys. Res. Lett.* **50**, e2023GL103334
- 244 S. Lee, M.K. Tippett and L.M. Polvani, 2023: **A new year-round weather regime classification for North America**, *J. Climate* **36**, 7091–7108
- 243 P. Czarnecki, L.M. Polvani and R. Pincus, 2023: **Sparse, Empirically optimized quadrature for broadband spectral integration**, *J. Advan. Model. Earth Syst.* **15**, e2023MS003819
- 242 D. Raiter, L.M. Polvani, I. Mitevski, A.G. Pendergrass and C. Orbe, 2023: **Little change in apparent hydrological sensitivity at large CO<sub>2</sub> forcing**, *Geophys. Res. Lett.* **50**, e2023GL104954
- 241 M. Bushuk, L.M. Polvani and M.R. England, 2023: **Comparing the impacts of ozone-depleting substances and carbon dioxide on Arctic sea ice loss**, *Environ. Res. Climate* **2**, 041001
240. Z. McGraw, T. Storelvmo, L.M. Polvani, S. Hofer, J. Shaw and A. Gettelman, 2023: **On the links between ice nucleation, cloud phase, and climate sensitivity in CESM2**, *Geophys. Res. Lett.*, **50**, e2023GL105053
239. S.-N. Zhou , Y.-C. Liang, I. Mitevski and L.M. Polvani, 2023: **Stronger Arctic amplification produced by decreasing, not increasing, CO<sub>2</sub> concentrations**, *Environ. Res. Climate* **2**, 045001
238. T. Janoski, M. Previdi, G. Chiodo, K.L. Smith and L.M. Polvani, 2023: **Ultrafast Arctic amplification and its governing mechanisms**, *Environ. Res. Climate* **2**, 035009
237. I. Mitevski, Y. Dong, L.M. Polvani, M. Rugenstein and C. Orbe, 2023: **Non-monotonic feedback dependence on CO<sub>2</sub> due to a North Atlantic pattern effect**, *Geophys. Res. Lett.* **50**, e2023GL103617
236. M.R. England and L.M. Polvani, 2023: **The Montreal Protocol is delaying the occurrence of the first ice-free Arctic summer**, *Proc. Nat. Acad. Sci.* **120**, e2211432120
235. L.M. Polvani, J. Keeble, A. Banerjee, R. Checa-Garcia, G. Chiodo, H. Rieder and K. Rosenlof, 2023: **No evidence of worsening Arctic springtime ozone losses over the 21st century**, *Nature Communications* **14**:1608

234. M. Sigmond, L.M. Polvani, J.C. Fyfe, C.J. Smith, J.N.S. Cole and M.R. England, 2023: **Large contribution of ozone-depleting substances to global and Arctic warming in the late 20th century**, *Geophys. Res. Lett.* **50**, e2022GL100563
233. H.A. Singh, N. Goldenson, J.C. Fyfe and L.M. Polvani, 2023: **Irreducible Southern Ocean state uncertainty due to global ocean initial conditions**, *J. Climate* **35**, 383–403
232. Y.-T. Wu, Y.-C. Liang, Y.-N. Kuo, F. Lehner, M. Previdi, L.M. Polvani, M.-H. Lo and C.-W. Lan, 2023: **Exploiting SMILEs to understand Arctic climate change seasonality and Uncertainty**, *Geophys. Res. Lett.* **50**, e2022GL100745

## 2022

231. A. Fiore and 9 co-authors (including L.M. Polvani), 2022: **Understanding recent tropospheric ozone trends in the context of large internal variability: A new perspective from chemistry-climate model ensembles**, *Environ. Res. ClimateJ. Climate* **1**, 025008
230. S. Lee, L.M. Polvani and B. Guan, 2022: **Modulation of Atmospheric Rivers by the Arctic Stratospheric Polar Vortex**, *Geophys. Res. Lett.* **49**, e2022GL100381
229. K. DallaSanta and L.M. Polvani, 2022: **Volcanic stratospheric injections up to 160 Tg(S) yield a Eurasian winter warming indistinguishable from internal variability**, *Atmos. Chem. Phys.* **22**, 8842–8862
228. G. Chiodo and L.M. Polvani, 2022: **New insights on the radiative impacts of ozone-depleting substances**, *Geophys. Res. Lett.* **49**, e2021GL096783
227. R. Chemke, L. Zanna, C. Orbe, L. Sentman and L.M. Polvani, 2022: **The future intensification of the North Atlantic winter storm track: the key role of dynamic ocean coupling**, *J. Climate* **35**, 2407–2421
226. S. Hay, P.J. Kushner, R. Blackport, K.E. McCusker, T. Oudar, L. Sun, M. England, C. Deser, J.A. Screen and L.M. Polvani, 2022: **Separating the influences of low-latitude warming and sea-ice loss on Northern Hemisphere climate change**, *J. Climate* **35**, 2327–2349
225. I. Mitevski, L.M. Polvani and C. Orbe, 2022: **Asymmetric warming/cooling response to CO<sub>2</sub> increase/decrease due to non-logarithmic forcing, not feedbacks**, *Geophys. Res. Lett.* **23**, e2021GL097133
224. A. Scaife and 19 co-authors (including L.M. Polvani), 2022: **Long Range Prediction and the Stratosphere**, *Atoms. Chem. Phys.* **22**, 2601–2623
223. Y.-C. Liang, L.M. Polvani and I. Mitevski, 2022: **Arctic amplification, and its seasonal migration, over a wide range of abrupt CO<sub>2</sub> forcing**, *npj Clim. Atmos. Sci.* **5**, 14
222. Y.-C. Liang, L.M. Polvani, M. Previdi, K.L. Smith, M.R. England and G. Chiodo, 2022: **Stronger Arctic Amplification from Ozone-Depleting Substances than from Carbon Dioxide**, *Environ. Res. Lett.* **17**:024010

## 2021

221. J. Oehrlein, L.M. Polvani, L. Sun and C. Deser, 2021: **How well do we know the surface impact of sudden stratospheric warmings?** *Geophys. Res. Lett.* **48**, 22, e2021GL095493

220. B. De, G. Tselioudis and L.M. Polvani, 2021: **Improved representation of atmospheric dynamics in CMIP6 models removes climate sensitivity dependence on Hadley Cell climatological extent**, *Atmos. Sci. Lett.* **22**:e1073
219. L.M. Polvani, A. Banerjee, R. Chemke, E.W. Doddridge, D.Ferreira, A. Gnanadesikan, M.A. Holland, Y. Kostov, J. Marshall, W.J.M. Seviour, S. Solomon, and D.W. Waugh, 2021: **Interannual SAM modulation of Antarctic sea ice extent does not account for its long-term trends, pointing to a limited role for ozone depletion**, *Geophys. Res. Lett.* **48**, 21, e2021GL094871
218. M. Previdi, K.L. Smith and L.M. Polvani, 2021: **Arctic amplification of climate change: A review of underlying mechanisms**, *Environ. Res. Lett.* **16**:093003
217. R. Chemke, L.M. Polvani, J. Kay and C. Orbe, 2021: **Quantifying the role of ocean coupling in Arctic amplification and sea-ice loss over the 21st century**, *npj Clim. Atmos. Sci.* **4**, 46
216. K.L. Smith and L.M. Polvani, 2021: **Modeling evidence for a large, ENSO-driven, interannual, wintertime AMOC variability**, *Environ. Res. Lett.* **16**:084038
215. P. Pisoft, P. Sacha, L.M. Polvani, and 11 co-authors, 2021: **Stratospheric contraction caused by increasing greenhouse gases**, *Environ. Res. Lett.* **16**:064038
214. A. Banerjee, A.H. Butler, L.M. Polvani, A. Robock, I.R. Simpson and L. Sun, 2021: **Robust winter warming over Eurasia under stratospheric sulfate geoengineering - the role of stratospheric dynamics** **21**, 6985-6997
213. I. Mitevski, C. Orbe, R. Chemke, L. Nazarenko and L.M. Polvani, 2021: **Non-monotonic response of the climate system to abrupt CO<sub>2</sub> forcing**, *Geophys. Res. Lett.* **48**, e2020GL090861
212. R. Chemke and L.M. Polvani, 2021: **Elucidating the mechanisms responsible for Hadley cell weakening under 4×CO<sub>2</sub> forcing**, *Geophys. Res. Lett.* **48**, e2020GL090348

## 2020

211. R. Chemke, M. Previdi, M.R. England and L.M. Polvani, 2020: **Distinguishing the impacts of ozone and ozone depleting substances on the recent increase in Antarctic surface mass balance**, *The Cryosphere* **14**, 4135-4144
210. L.M. Polvani and S.J. Camargo, 2020: **Scant evidence for a volcanically forced winter warming over Eurasia following the Krakatau eruption of August 1883**, *Atmos. Chem. Phys.* **20**, 13687–13700
209. D.M. Mitchell, Y.T. Lo, W.J.M. Seviour, L. Haimberger and L.M. Polvani, 2020: **The vertical profile of recent tropical temperature trends: Persistent model biases in the context of internal variability**, *Environ. Sci. Lett.*, **15**:1040b4
208. H.A. Singh and L.M. Polvani, 2020: **Low Antarctic climate sensitivity due to high ice sheet orography**, *npj Climate and Atmospheric Science*, **3**, 39
207. M.R. England, L.M. Polvani, L. Sun, 2020: **Robust Arctic warming caused by projected Antarctic sea ice loss**, *Environ. Res. Lett.* **15**:104005
206. J. Oehrlein, G. Chiodo and L.M. Polvani, 2020: **The effect of interactive ozone chemistry on weak and strong stratospheric polar vortex events**, *Atmos. Chem. Phys.* **20**, 10531-10544

205. D.W. Waugh, A. Banerjee, J.C. Fyfe and L.M. Polvani, 2020: **Contrasting recent trends in Southern Hemisphere Westerlies across different ocean basins**, *Geophys. Res. Lett.* **47**, 18, e2020GL088890
204. M. Previdi, T. Janoski, G. Chiodo, K.L. Smith and L.M. Polvani, 2020: **Arctic amplification as a rapid adjustment to increased CO<sub>2</sub>**, *Geophys. Res. Lett.* **47**, 17, e2020GL089933
203. B. De, Y. Wu and L.M. Polvani, 2020: **Non-additivity of the mid-latitude circulation response to regional Arctic temperature anomalies: the role of the stratosphere**, *Geophys. Res. Lett.* **47**, 16, e2020GL088057
202. R. Chemke and L.M. Polvani, 2020: **Using multiple large ensembles to elucidate the discrepancy between the 1979-2019 modeled and observed Antarctic sea-ice trends**, *Geophys. Res. Lett.* **47**, 16, e2020GL088057
201. A. Steiner and 18 co-authors (including L.M. Polvani), 2020: **Observed temperature changes in the troposphere and stratosphere from 1979 to 2018**, *J. Climate* **33**, 8165-8194
200. B. Ayarzagüena and 20 co-authors (including L.M. Polvani), 2020: **Uncertainty in the response of stratospheric sudden warmings and stratosphere-troposphere coupling to quadrupled CO<sub>2</sub> concentrations in CMIP6 models**, *J. Geophys. Res.* **126**, 6, e2019JD032345
199. M.R. England, L.M. Polvani, L. Sun and C. Deser, 2020: **Tropical climate responses to projected Arctic and Antarctic sea ice loss**, *Nature Geoscience* **13**, 275-281
198. A. Banerjee, J.C. Fyfe, L.M. Polvani, D.W. Waugh and K.-L. Chang, 2020: **A pause in Southern Hemisphere circulation trends due to the Montreal Protocol**, *Nature* **579**, 544-548
197. R. Chemke, L.M. Polvani and L. Zanna, 2020: **Identifying a human signal in the North Atlantic warming hole**, *Nature Comm.* **11**:1540
196. R. Chemke and L.M. Polvani, 2020: **Linking midlatitudes eddy heat flux trends and polar amplification**, *npj Clim. Atmos. Sci.* **3**, 8
195. L.M. Polvani, M. Previdi, M.R. England, G. Chiodo and K.L. Smith, 2020: **Substantial twentieth-century Arctic warming caused by ozone depleting substances**, *Nature Climate Change* **10**, 130-133
194. G. Danabasoglu and 42 co-authors (including L.M. Polvani), 2020: **The Community Earth System Model version 2 (CESM2)**, *J. Adv. Model. Earth. Syst.* **12**, 2, e2019MS001916
- 2019**
193. H. Singh, L.M. Polvani and P.J. Rasch, 2019: **Antarctic sea ice expansion, driven by internal variability, in the presence of increasing atmospheric CO<sub>2</sub>**, 14,762–14,771
192. A. Gettelman and 23 co-authors (including L.M. Polvani), 2019: **The Whole Atmosphere Community Climate Model Version 6 (WACCM6)**, *J. Geophys. Res.* **124**, 12380–12403
191. G. Chiodo and L.M. Polvani, 2019: **The response of the ozone layer to quadrupled CO<sub>2</sub> concentrations: Implications for climate**, *J. Climate* **32**, 7639–7642
190. A. Banerjee, G. Chiodo, M. Previdi, M. Ponater, A.J. Conley and L.M. Polvani, 2019: **Stratospheric water vapor: an important climate feedback**, *Clim. Dyn.* **53**, 1697–1710

189. W.J.M. Seviour, F. Codron, E.W. Doddridge, D.Ferreira, A. Gnanadesikan, Y. Kostov, J. Marshall, L.M. Polvani, J.L. Thomas and D.W. Waugh, 2019: **The Southern Ocean sea surface temperature response to ozone depletion: A multi-model comparison**, *J. Climate* **32**, 5107–5121
188. L.M. Polvani, L. Wang, M. Abalos and CCMI co-authors, 2019: **Large impacts, past and future, of ozone-depleting substances on Brewer-Dobson circulation trends: A multi-model assessment**, *J. Geophys. Res.* **124**, 6669–6680
187. R. Chemke and L.M. Polvani, 2019: **Opposite tropical circulation trends in climate models and in reanalyses**, *Nature Geoscience* **12**, 528–532
186. M. England, A. Jahn and L.M. Polvani, 2019: **Non-uniform contribution of internal variability to recent Arctic sea ice loss**, *J. Climate*. **32**, 4039–4053
185. J. Oehrlein, G. Chiodo and L.M. Polvani, 2019: **Separating and quantifying the distinct impacts of El Niño and stratospheric sudden warmings on North Atlantic and Eurasian wintertime climate**, *Atmos. Sci. Lett.* **20**:e923
184. S.J. Camargo and L.M. Polvani, 2019: **Little evidence of reduced global tropical cyclone activity following volcanic eruption**, *npj Clim. Atmos. Sci.* **2**:14
183. L.M. Polvani, A. Banerjee, A. Schmidt, 2019: **Northern Hemisphere continental winter warming the following the 1991 Mt. Pinatubo eruption: Reconciling models and observations**, *Atmos. Chem. Phys.* **19**, 6351–6366
182. H.E. Rieder, G. Chiodo, J. Fritzer, C. Wienerroither and L.M. Polvani, 2019: **Is interactive ozone chemistry important to represent polar cap stratospheric temperature variability in Earth-System Models?** *Environ. Res. Lett.* **14**:044026
181. M. Abalos, L.M. Polvani, N. Calvo, D. Kinnison, F. Ploeger and S. Solomon, 2019: **New insights on the impact of ozone depleting substances on the Brewer-Dobson circulation**, *J. Geophys. Res.* **124**, 2435–2451
180. L.M. Polvani and K. Bellomo, 2019: **The key role of ozone depleting substances in weakening the Walker circulation in the second half of the 20th century**, *J. Climate* **32**, 1411–1418
179. R. Chemke, L.M. Polvani and C. Deser, 2019: **The effect of Arctic sea-ice loss on the Hadley circulation**, *Geophys. Res. Lett.* **46**, 963–972
178. G. Chiodo, J. Oehrlein, L.M. Polvani, J. Fyfe and A.K. Smith, 2019: **Insignificant influence of the 11-year solar cycle on the North Atlantic Oscillation**, *Nature Geoscience* **12**, 1411–1418
177. R. Chemke and L.M. Polvani, 2019: **Exploiting the abrupt 4×CO<sub>2</sub> scenario to elucidate tropical expansion mechanisms**, *J. Climate* **32**, 859–875
- 2018**
176. B.R. Lipat, A. Voigt, G. Tselioudis and L.M. Polvani, 2018: **Model uncertainty in cloud-circulation coupling, and cloud-radiative response to increasing CO<sub>2</sub>, linked to biases in the climatological circulation**, *J. Climate* **31**, 10013–10020
175. R. Chemke and L.M. Polvani, 2018: **Ocean circulation reduces the Hadley cell response to increased greenhouse gases**, *Geophys. Res. Lett.* **45**, 9197–9205

174. K.L. Smith, L.M. Polvani and L.B. Tremblay, 2018: **The Impact of Stratospheric Circulation Extremes on Minimum Arctic Sea Ice Extent**, *J. Climate* **31**, 7169–7183
173. B. Ayarzagüena, L.M. Polvani, U. Langematz, and CCMI co-authors, 2018: **No Robust Evidence of Future Changes in Major Stratospheric Sudden Warmings: A Multi-model Assessment from CCMI**, *Atmos. Chem. Phys.* **18**, 11277–11287
172. M. England, L. Sun and L.M. Polvani, 2018: **Contrasting the Antarctic and Arctic atmospheric responses to projected sea ice loss in the late 21st Century**, *J. Climate* **31**, 6353–6370
171. K. Bellomo, L.N. Murphy, M.A. Cane, A.C. Clement and L.M. Polvani, 2018: **Historical Forcings as Main Drivers of the Atlantic Multidecadal Oscillation in the CESM Large Ensemble**, *Clim. Dyn.* **50**, 3687–3698
170. G.Chiodo, L.M. Polvani and co-authors, 2018: **The response of the ozone layer to quadrupled CO<sub>2</sub> concentrations**, *J. Climate* **31**, 3893–3907
169. L. Zhang K. Karauskas, J.B. Weiss and L.M. Polvani, 2018: **Observational evidence of the downstream impact on tropical rainfall from stratospheric Kelvin waves**, *Clim. Dyn.* **50**, 3775–3782
168. L.M. Polvani, M. Abalos, R. Garcia, D. Kinnison and W.J. Randel, 2018: **Significant weakening of Brewer-Dobson circulation trends over the 21st century as a consequence of the Montreal Protocol**, *Geophys. Res. Lett.* **45**, 401–409
167. K.L. Smith, G.Chiodo, M. Previdi and L.M. Polvani, 2018: **No surface cooling over Antarctica from the negative greenhouse effect associated with instantaneous quadrupling of CO<sub>2</sub> concentrations**, *J. Climate* **31**, 317–323

## 2017

166. L. Landrum, M. Holland, M. Raphael, and L.M. Polvani, 2017: **Stratospheric ozone depletion: an unlikely driver of the regional trends in Antarctic sea ice in austral fall in the late 20 th Century**, *Geophys. Res. Lett.* **44**, 11062–11070
165. W.J. Randel, L.M. Polvani, F. Wu, D.E. Kinnison, C-Z. Zou and C. Mears, 2017: **Troposphere-stratosphere temperature trends derived from satellite data compared with ensemble simulations from WACCM**, *J. Geophys. Res.* **122**, 9651–9667
164. K.M. Grise and L.M. Polvani, 2017: **Understanding the timescales of the tropospheric circulation response to abrupt CO<sub>2</sub> forcing in the Southern Hemisphere: Seasonality and the role of the stratosphere**, *J. Climate* **30**, 8497–8515
163. M. Previdi and L.M. Polvani, 2017: **Impact of the Montreal Protocol on Antarctic Surface Mass Balance and Implications for Global Sea-Level Rise**, *J. Climate* **30**, 7247–7253
162. P. Lin, D. Paynter, L.M. Polvani, G.J.P. Correa, Y. Ming and V. Ramaswamy, 2017: **Dependence of model-simulated response to ozone depletion on stratospheric polar vortex climatology**, *Geophys. Res. Lett.* **44**, 6391–6398
161. Y. Wu and L.M. Polvani, 2017: **Recent Trends in Extreme Precipitation and Temperature over Southeastern South America: The Dominant Role of Stratospheric Ozone Depletion**, *J. Climate* **30**, 6433–6441

160. B.R. Lipat, G. Tselioudis, K.M. Grise and L.M. Polvani, 2017: **CMIP5 models' climate sensitivity linked to the climatological Hadley cell extent**, *Geophys. Res. Lett.* **44**, 5739–5748
159. G. Chiodo, L.M. Polvani and M. Previdi, 2017: **Large increase in incident shortwave radiation due to the ozone hole offset by high climatological albedo over Antarctica**, *J. Climate* **30**, 4883–4890
158. W.J.M. Seviour, D.W. Waugh, L.M. Polvani, G.J.P. Correa and C.I. Garfinkel, 2017: **Robustness of the simulated tropospheric response to ozone depletion**, *J. Climate* **30**, 2577–2585
157. L.M. Polvani, L. Wang, V. Aquila and D.W. Waugh, 2017: **The impact of ozone depleting substances on tropical upwelling, as revealed by the absence of lower stratospheric cooling since the late 1990s**, *J. Climate* **30**, 2523–2534
156. L.M. Polvani, L. Sun, A.H. Butler, J.H. Richter and C. Deser, 2017: **Distinguishing stratospheric sudden warmings from ENSO as key drivers of wintertime climate variability over the North Atlantic and Eurasia**, *J. Climate* **30**, 1959–1969
155. A. Banerjee, L.M. Polvani and JC Fyfe, 2017: **The United States "warming hole": quantifying the forced aerosol response given large internal variability**, *Geophys. Res. Lett.*, **44**, 1928–1937
154. G. Chiodo and L.M. Polvani, 2017: **Reduced Southern Hemispheric circulation response to quadrupled CO<sub>2</sub> due to stratospheric ozone feedback**, *Geophys. Res. Lett.* **44**, 465–474
153. K.L. Smith and L.M. Polvani, 2017: **Spatial patterns of recent Antarctic surface temperature trends and the importance of natural variability: Lessons from multiple reconstructions and the CMIP5 models**, *Clim. Dyn.* **48**, 2653–2670

## 2016

152. A. Solomon, L.M. Polvani, D.W. Waugh and S. Davis, 2016: **Contrasting Upper and Lower Atmospheric Metrics of Tropical Expansion in the Southern Hemisphere**, *Geophys. Res. Lett.* **43**, 10496–10503
151. K. Bellomo, A.C. Clement, L.N. Murphy, L.M. Polvani and M.A. Cane, 2016: **New Observational Evidence for a Positive Cloud Feedback that Amplifies the Atlantic Multidecadal Oscillation**, *Geophys. Res. Lett.* **43**, 9852–9859
150. M. Previdi and L.M. Polvani, 2016: **Anthropogenic impact on Antarctic surface mass balance, currently masked by natural variability, to emerge by mid-century**, *Environ. Res. Lett.* **11**:094001
149. M.R. England, L.M. Polvani, K.L. Smith, L. Landrum and M.M. Holland, 2016: **Robust response of the Amundsen Sea Low to stratospheric ozone depletion**, *Geophys. Res. Lett.* **43**, 8207–8213
148. V. Aquila, W.H. Swartz, D.W. Waugh, P.R. Colarco, S. Pawson, and L.M. Polvani, 2016: **Isolating the roles of different forcing agents in global stratospheric temperature changes using model integrations with incrementally added single forcings**, *J. Geophys. Res.* **121**, 8067–8082
147. K.M. Grise and L.M. Polvani, 2016: **Is climate sensitivity related to dynamical sensitivity?** *J. Geophys. Res.* **121**, 5159–5176
146. E.A. Barnes, S. Solomon and L.M. Polvani, 2016: **Robust wind and precipitation responses to the Mount Pinatubo eruption, as simulated in the CMIP5 models**, *J. Climate* **29**, 4763–4778

145. G. Tselioudis, B. Lipat, D. Konsta, K.M. Grise and L.M. Polvani, 2016: **Midlatitude cloud shifts, their primary link to the Hadley cell, and their diverse radiative effects**, *Geophys. Res. Lett.* **43**, 4594–4601
144. D.R. Marsh, J.-F. Lamarque, A.J. Conley and L.M. Polvani, 2016: **Stratospheric ozone chemistry feedbacks are not critical for the determination of climate sensitivity in CESM1(WACCM)**, *Geophys. Res. Lett.* **43**, 3928–3934
143. G. Chiodo and L.M. Polvani, 2016: **Reduction of climate sensitivity to solar forcing due to stratospheric ozone feedback**, *J. Climate* **29**, 4651–4663
142. A. Solomon and L.M. Polvani, 2016: **Highly significant responses to anthropogenic forcings of the midlatitude jet in the Southern Hemisphere**, *J. Climate* **29**, 3463–3470
141. M.R. England, T.A. Shaw and L.M. Polvani, 2016: **Troposphere-stratosphere dynamical coupling in the Southern high latitudes, and its linkage to the Amundsen Sea**, *J. Geophys. Res.* **121**, 3776–3789
140. I. Simpson and L.M. Polvani, 2016: **Revisiting the relationship between jet position, forced response and annular mode variability in the Southern mid-latitudes**, *Geophys. Res. Lett.* **121**, 3776–3789
139. L.M. Polvani, S.J. Camargo and R.R. Garcia, 2016: **The importance of the Montreal Protocol in mitigating the potential intensity of tropical cyclones**, *J. Climate* **29**, 2275–2289
138. R.K. Scott, L.M. Harris and L.M. Polvani, 2016: **A testcase for the inviscid shallow water equations on the sphere**, *Quart. J. Roy. Meteor. Soc.* **142**, 488–595

## 2015

137. C.I. Garfinkel, D.W. Waugh and L.M. Polvani, 2015: **Recent Hadley cell expansion: the role of internal atmospheric variability**, *Geophys. Res. Lett.* **42**, 10824–10831
136. K.M. Grise, L.M. Polvani and J.T. Fasullo, 2015: **Re-examining the emergent constraint between climate sensitivity and the Southern Hemisphere radiation budget in CMIP models**, *J. Climate* **28**, 9298–9312
135. C. Orbe, P.A. Newman, D.W. Waugh, M. Holzer, L.D. Oman, F. Li and L.M. Polvani, 2015: **Air Mass Origin in the Arctic. Part II: Response to Increases in Greenhouse Gases**, *J. Climate* **28**, 9105–9120
134. M. Previdi, K.L. Smith and L.M. Polvani, 2015: **How well do the CMIP5 models simulate the Antarctic atmospheric energy budget?** *J. Climate* **28**, 7933–7942
133. N. Calvo, L.M. Polvani and S. Solomon, 2015 **On the surface impact of Arctic ozone extremes**, *Environ. Res. Lett.* **10**:094003
132. D.W. Waugh, C.I. Garfinkel and L.M. Polvani, 2015: **Drivers of the recent tropical expansion in the Southern Hemisphere: Changing SSTs or ozone depletion?** *J. Climate* **28**, 6581–6586
131. A. Solomon, L.M. Polvani, K.L. Smith and R.P. Abernathy, 2015: **The impact of ozone depleting substances on the circulation, temperature and salinity of the Southern Ocean: An attribution study with CESM1(WACCM)**, *Geophys. Res. Lett.* **42**, 5547–5555

- 130 Y. Wu and L.M. Polvani, 2015: **Contrasting short and long term projections of the hydrological cycle in the Southern extratropics**, *J. Climate* **28**, 5845–5856
129. E.A. Barnes and L.M. Polvani, 2015: **CMIP5 projections of Arctic amplification, of the North American/North Atlantic circulation, and of their relationship**, *J. Climate* **28**, 5254–5271
128. C. Orbe, P.A. Newman, D.W. Waugh, M. Holzer, L.D. Oman, F. Li and L.M. Polvani, 2015: **Air Mass Origin in the Arctic. Part I: Seasonality**, *J. Climate* **28**, 4997–5014
127. J.F. Booth, L.M. Polvani, P.A. O’Gorman and S.Wang, 2015: **Effective Stability in a Moist Baroclinic Wave**, *Atmos. Sci. Lett.* **16**, 56–62

## 2014

126. M. Previdi and L.M. Polvani, 2014: **Climate system response to stratospheric ozone depletion and recovery**, *Quart. J. Roy. Meteor. Soc.* **140**, 2401–2419
125. R.R. Neely, D.R. Marsh, K.L. Smith, S.M. David and L.M. Polvani, 2014: **Biases in Southern Hemisphere climate trends induced by coarsely specifying the temporal resolution of stratospheric ozone**, *Geophys. Res. Lett.* **41**, 8602–8610
124. S. Wang, S.J. Camargo, A.H. Sobel and L.M. Polvani, 2014: **Impact of tropopause temperature on the intensity of tropical cyclones: An idealized study using a mesoscale model**, *J. Atmos. Sci.* **71**, 4333–4348
123. K.M. Grise and L.M. Polvani, 2014: **The response of midlatitude jets to increased CO<sub>2</sub>: Distinguishing the roles of sea surface temperature and direct radiative forcing**, *Geophys. Res. Lett.* **41**, 6863–6871
122. L. Sun, C. Deser, L.M. Polvani and R. Tomas, 2014: **Influence of projected Arctic sea ice loss on polar stratospheric ozone and circulation in spring**, *Environ. Res. Lett.* **9**:084016
121. K.L. Smith, R.R. Neely, D.R. Marsh and L.M. Polvani, 2014: **The Specified Chemistry Whole Atmosphere Community Climate Model (SC-WACCM)**, *J. Adv. Model. Earth. Syst.* **06**, doi: 10.1002/2014MS000346
120. K.M. Grise and L.M. Polvani, 2014: **Southern Hemisphere cloud-dynamics biases in CMIP5 models and their implications for climate projections**, *J. Climate* **27**, 6074-6092
119. K.L. Smith and L.M. Polvani, 2014: **The surface impacts of Arctic stratospheric ozone anomalies**, *Environ. Sci. Lett.* **9**:074015
118. H.E. Rieder, L.M. Polvani and S. Solomon, 2014: **Distinguishing the impacts of ozone depleting substances and well-mixed greenhouse gases on Arctic stratospheric ozone and temperature trends**, *Geophys. Res. Lett.* **41**, 2652–2660
117. A.H. Butler, L.M. Polvani and C. Deser, 2014: **Separating the stratospheric and tropospheric pathways of El Niño-Southern Oscillation teleconnections**, *Environ. Res. Lett.* **9**:024014
116. K.M. Grise and L.M. Polvani, 2014: **Is climate sensitivity related to dynamical sensitivity? A Southern Hemisphere perspective**, *Geophys. Res. Lett.* **41**, 534–540

115. E.A. Barnes, N.W. Barnes and L.M. Polvani, 2014: **Delayed Southern Hemisphere climate change induced by stratospheric ozone recovery, as projected by the CMIP5 models**, *J. Climate* **27**, 852–867
114. C. Orbe, M. Holzer, L.M. Polvani, D.W. Waugh, et al., 2014: **Seasonal Ventilation of the Stratosphere: Robust Diagnostics from One-Way Flux Distributions**, *J. Geophys. Res.* **9**, 293–306
113. K.M. Grise, S.-W. Son, G.P.J. Correa and L.M. Polvani, 2014: **The response of mid-latitude storms in the Southern Hemisphere to stratospheric ozone depletion in the 20th Century**, *Atmos. Sci. Lett.* **15**, 29–36
112. P.L.M. Gonzalez, L.M. Polvani, R. Seager and G.J.P. Correa, 2014: **Stratospheric ozone depletion: a key driver of recent precipitation trends in South Eastern South America**, *Clim. Dyn.* **42**, 1775–1792

### 2013

111. Y. Wu, L.M. Polvani and R. Seager, 2013: **The importance of the Montreal Protocol in protecting the Earth's hydroclimate**, *J. Climate* **26**, 4049–4068
110. E.A. Barnes and L.M. Polvani, 2013: **Response of the midlatitude jets, and of their variability, to increased greenhouse gases in the CMIP5 models**, *J. Climate* **26**, 7117–7135
109. K.L. Smith, M. Previdi and L.M. Polvani, 2013: **The Antarctic atmospheric energy budget. Part II: The Effect of Ozone Depletion and its Projected Recovery**, *J. Climate* **26**, 9729–9744
108. M. Previdi, K.L. Smith and L.M. Polvani, 2013: **The Antarctic atmospheric energy budget. Part I: Climatology and intraseasonal-to-interannual variability**, *J. Climate* **26**, 6406–6418
107. S.M. Kang, C. Deser and L.M. Polvani, 2013: **Uncertainty in climate change projections of the Hadley circulation: the role of internal variability**, *J. Climate* **26**, 7541–7554
106. N.F. Tandon, E.P. Gerber, A.H. Sobel and L.M. Polvani, 2013: **Understanding Hadley cell expansion vs. contraction: Insights from simplified models and implications for recent observations**, *J. Climate* **26**, 4304–4321
105. D.R. Marsh, M.J. Mills, D.E. Kinnison, J.-F. Lamarque, N. Calvo and L.M. Polvani, 2013: **Climate change from 1850 to 2005 simulated in CESM1(WACCM)**, *J. Climate* **26**, 7372–7391
104. S.W. Son, A. Purich, H.H. Hendon, B.M. Kim and L.M. Polvani, 2013: **Improved seasonal forecast using ozone hole variability?** *Geophys. Res. Lett.* **40**, 6231–6235
103. H.E. Rieder and L.M. Polvani, 2013: **Are recent Arctic ozone losses caused by increasing greenhouse gases?** *Geophys. Res. Lett.* **40**, 4437–4441
102. S.M. Kang, L.M. Polvani, J.C. Fyfe, S.-W. Son, M. Sigmond, and G.J.P. Correa, 2013: **Modeling evidence that ozone depletion has impacted extreme precipitation in the austral summer**, *Geophys. Res. Lett.* **40**, 4054–4059
101. K.M. Grise, L.M. Polvani, G. Tselioudis, Y. Wu and M.D. Zelinka, 2013: **The ozone hole indirect effect: Cloud-radiative anomalies accompanying the poleward shift of the eddy-driven jet in the Southern Hemisphere**, *Geophys. Res. Lett.* **40**, 3688–3692

100. L.M. Polvani and K.L. Smith, 2013: **Can natural variability explain observed Antarctic sea ice trends? New modeling evidence from CMIP5**, *Geophys. Res. Lett.* **40**, 3195–3199
99. E.A. Barnes, L.M. Polvani and A.H. Sobel, 2013: **Model projections of atmospheric steering of Sandy-like superstorms**, *Proc. Nat. Acad. Sci.* **110**, 15211–15215
98. M. Holzer and L.M. Polvani, 2013: **Lifetime dependent flux into the lower stratosphere for idealized trace gases of surface origin**, *J. Geophys. Res.* **118**, 9367–9375
97. A.J. Charlton-Perez, M.P. Baldwin, T. Birner, R.X. Black, A.H. Butler, N. Calvo, N.A. Davis, E.P. Gerber, N. Gillett, S. Hardiman, J. Kim, K. Krueger, Y.-Y. Lee, E. Manzini, B.A. McDaniel, L.M. Polvani, T. Reichler, T.A. Shaw, M. Sigmond, S.-W. Son, M. Toohey, L.J. Wilcox, S. Yoden, B. Christiansen, F. Lott, D. Shindell, S. Yukimoto, and S. Watanabe, 2013: **On the lack of stratospheric dynamical variability in low-top versions of the CMIP5 models**, *J. Geophys. Res.* **118**, 1–12
96. C. Orbe, M. Holzer, L.M. Polvani and D.W. Waugh, 2013: **Air-mass origin as a diagnostic of climate change in tropospheric transport**, *J. Geophys. Res.* **18**, 1459–1470
95. J.F. Booth, S. Wang, and L.M. Polvani, 2013: **Midlatitude storms in a moister world: Lessons from idealized baroclinic life cycle experiments**, *Clim. Dyn.* **41**, 787–802
94. H.E. Rieder, A.M. Fiore, L.M. Polvani, J.-F. Lamarque and Y.Y. Fang, 2013: **Changes in the frequency and return level of high ozone pollution events over the Eastern United States following emission controls**, *Environ. Res. Lett.* **8**:014012

## 2012

93. K.M. Smith, L.M. Polvani and D.R. Marsh, 2012: **Mitigation of 21st century Antarctic sea ice loss by stratospheric ozone recovery**, *Geophys. Res. Lett.* **39**, L20701
92. C.M. Bitz and L.M. Polvani, 2012: **Antarctic climate response to stratospheric ozone depletion in a fine resolution ocean climate model**, *Geophys. Res. Lett.* **39**, L20705
91. C.I. Garfinkel, A.H. Butler, D.W. Waugh, M.M. Hurwitz and L.M. Polvani, 2012: **Why might stratospheric sudden warmings occur with similar frequency in El Niño and La Niña winters?** *J. Geophys. Res.*, **117**, D19106
90. L.M. Polvani and S. Solomon, 2012: **The signature of ozone depletion on tropical temperature trends, as revealed by their seasonal cycle in model integrations with single forcings**, *J. Geophys. Res.* **117**, D17102
89. S. Wang, E.P. Gerber and L.M. Polvani, 2012: **Abrupt circulation responses to tropical upper tropospheric warming in a relatively simple whole-atmosphere GCM**, *J. Climate* **25**, 4097–4115
88. M. Previdi and L.M. Polvani, 2012: **Comment on "Tropospheric temperature response to stratospheric ozone recovery in the 21st century" by Hu et al.**, *Atmos. Chem. Phys.* **12**, 4893–4896
87. T. Ndarana, D.W. Waugh, L.M. Polvani, G.J.P. Correa and E.P. Gerber, 2012: **Antarctic ozone depletion and trends in tropospheric Rossby wave breaking**, *Atmos. Sci. Lett.* **13**, 164–168
86. C. Orbe, M. Holzer and L.M. Polvani, 2012: **Flux distributions as robust diagnostics of stratosphere-troposphere exchange**, *J. Geophys. Res.* **117**, D01302

**2011**

85. A.P. Showman and L.M. Polvani, 2011: **Equatorial superrotation on tidally locked exoplanets**, *Astrophys. J.* **738**, 71
84. A.H. Butler and L.M. Polvani, 2011: **El Niño, La Niña, and stratospheric sudden warmings: A re-evaluation in light of the observational record**, *Geophys. Res. Lett.* **38**, L13807
83. S.-W. Son, N.F. Tandon and L.M. Polvani, 2011: **The fine-scale structure of the global tropopause derived from COSMIC GPS radio occultation measurements**, *J. Geophys. Res.* **116**, D20113
82. S. Kang, L.M. Polvani, J.C. Fyfe and M. Sigmond, 2011: **Impact of polar ozone depletion on subtropical precipitation**, *Science* **332**, 951–954
81. N.F. Tandon, L.M. Polvani and S.M. Davis, 2011: **The response of the tropospheric circulation to water vapor-like forcings in the stratosphere**, *J. Climate* **24**, 5713–5720
80. L.M. Polvani, D.W. Waugh, G.J.P. Correa and S.-W. Son, 2011: **Stratospheric ozone depletion: the main driver of 20th Century atmospheric circulation changes in the Southern Hemisphere**, *J. Climate* **34**, 795–812
79. L.M. Polvani, M. Previdi and C. Deser, 2011: **Large cancellation, due to ozone recovery, of future Southern Hemisphere atmospheric circulation trends**, *Geophys. Res. Lett.* **38**, L04707
78. S.M. Kang and L.M. Polvani, 2011: **The interannual relationship between the eddy-driven jet and the edge of the Hadley cell**, *J. Climate* **24**, 563–568
77. S.Wang and L.M. Polvani, 2011: **Double tropopause formation in idealized baroclinic life cycles: The key role of an initial tropopause inversion layer**, *J. Geophys. Res.* **16**, D05108

**2010**

76. A.P. Showman and L.M. Polvani, 2010: **The Matsuno-Gill model and equatorial superrotation**, *Geophys. Res. Lett.* **37**, L18811
75. S.-W. Son, E.P. Gerber, J. Perlwitz, L. M. Polvani, N. Gillett, K.-H. Seo and CCMVal Co-authors, 2010: **The impact of stratospheric ozone on the Southern Hemisphere circulation changes: A multimodel assessment**, *J. Geophys. Res.* **115**, D00M07
74. D.W. Waugh and L.M. Polvani, 2010: **Stratospheric polar vortices**, in *The Stratosphere: Dynamics, Chemistry, and Transport*, *Geophys. Monogr. Ser.*, **190**, edited by L. M. Polvani, A. H. Sobel, and D. W. Waugh, pp. 43–57, AGU, Washington DC

**2009**

73. E.P. Gerber, C. Orbe and L.M. Polvani, 2009: **Stratospheric influence on the tropospheric circulation revealed by idealized ensemble forecasts**, *Geophys. Res. Lett.* **36**, L24801
72. S.W. Son, N. Tandon, L. M. Polvani and D.W. Waugh, 2009: **The ozone hole and Southern Hemisphere climate change**, *Geophys. Rev. Lett.* **36**, L15705
71. O. Martius, L.M. Polvani and H.C. Davies, 2009: **Blocking precursors to stratospheric sudden warming events**, *Geophys. Rev. Lett.* **36**, L14806

70. E.P. Gerber and L.M. Polvani: **Stratosphere-troposphere coupling in a relatively simple AGCM: The importance of stratospheric variability**, *J. Climate* **22**, 1920–1933
69. N.J. Matthewman, J.G. Esler, A.J. Charlton-Perez and L.M. Polvani, 2009: **A new look at stratospheric sudden warmings. Part III. Polar vortex evolution and vertical structure**, *J. Climate* **22**, 1566–1585
68. S.W. Son, M. Ting and L.M. Polvani, 2009: **The effect of topography on storm track intensity in a simple general circulation model**, *J. Atmos. Sci.* **66**, 393–411
67. S.W. Son, **L. M. Polvani**, and CCMVal co-authors, 2009: **The impact of stratospheric ozone recovery on tropopause height trends**, *J. Climate* **22**, 429–445

### 2008

66. R.K. Scott and L.M. Polvani, 2008: **Equatorial superrotation in shallow atmospheres**, *Geophys. Res. Lett.* **35**, L24202
65. E.P. Gerber, L.M. Polvani and D. Ancukiewicz, 2008: **Annular mode time scales in the Intergovernmental Panel on Climate Change Fourth Assessment Report models**, *Geophys. Res. Lett.* **35**, L22707
64. A.J. Charlton, L.M. Polvani, J. Austin and F. Li, 2008: **The Frequency and Dynamics of Stratospheric Sudden Warmings in the 21st Century**, *J. Geophys. Res.* **113**, D1611
63. S.W. Son, L.M. Polvani, D.W.W. Waugh and CCMVal co-authors, 2008: **The Impact of Stratospheric Ozone Recovery on the Southern Hemisphere Westerlies in the 21st Century**, *Science* **320**, 1486–1489
62. R.K. Scott, L.M. Polvani and D.W. Waugh, 2008: **Internal variability of the winter stratosphere. Part II: Time dependent forcing**, *J. Atmos. Sci.* **65**, 2375–2388
61. E.P. Gerber, S. Voronin and L.M. Polvani, 2008: **Testing the Annular Mode decorrelation time scale in simple atmospheric general circulation models**, *Mon. Weather Rev.* **136**, 1523–1536
60. K.D. Krouse, A.H. Sobel and L.M. Polvani, 2008: **On the wavelength of Rossby waves radiated by tropical cyclones**, *J. Atmos. Sci.* **65**, 644–654

### 2007

59. L.M. Polvani and J.G. Esler, 2007: **Transport and mixing of chemical air masses in idealized baroclinic life cycles**, *J. Geophys. Res.* **112**, D23102
  58. R.K. Scott and L.M. Polvani, 2007: **Forced-dissipative shallow-water turbulence on the sphere and the atmospheric circulation of the giant planets**, *J. Atmos. Sci.* **64**, 3158–3176
  57. S.W. Son and L.M. Polvani, 2007: **The dynamical formation of an extra-tropical tropopause inversion layer in a relatively simple general circulation model**, *Geophys. Res. Lett.* **34**, L17806
  56. A.J. Charlton and L.M. Polvani, 2007: **A new look at stratospheric sudden warmings. Part I. Climatology and modeling benchmarks**, *J. Climate* **20**, 449–469
- and A.J. Charlton and L.M. Polvani, 2011: **Corrigendum**, *J. Climate* **24**, 5951

55. A.J. Charlton, L.M. Polvani, J. Perlwitz, F. Sassi, E. Manzini, S. Pawson, J.E. Nielsen, K. Shibata and D. Rind, 2007: **A new look at stratospheric sudden warmings. Part II. Evaluation of numerical model simulations**, *J. Climate* **20**, 470–488
54. M.A.H. Wittman, A.J. Charlton and L.M. Polvani, 2007: **The effect of lower stratospheric shear on baroclinic instability**, *J. Atmos. Sci.* **64**, 479–496

#### 2006

53. R.K. Scott and L.M. Polvani, 2006: **Internal variability of the winter stratosphere. Part I: Time independent forcing**, *J. Atmos. Sci.* **63**, 2758–2776
52. P.J. Kushner and L.M. Polvani, 2006: **Stratosphere-troposphere coupling in a relatively simple AGCM: Impact of the seasonal cycle**, *J. Climate* **19**, 5721–5727
51. S.P. Burns, A.H. Sobel and L.M. Polvani, 2006: **Asymptotic solutions of the axisymmetric moist Hadley circulation in a model with two vertical modes**, *Theor. Comp. Fluid Dyn.*, doi:10.1007/s00162-006-0024z
50. J.G. Esler, L.M. Polvani and R.K. Scott, 2006: **The Antarctic Stratospheric Sudden Warming of 2002: A Self-Tuned Resonance?** *Geophys. Res. Lett.* **33**, L12804

#### 2005

49. T. Reichler, P.J. Kushner and L.M. Polvani, 2005: **The coupled stratosphere-troposphere response to impulsive forcing from the troposphere**, *J. Atmos. Sci.* **62**, 3337–3352
48. M.A.H. Wittman, A.J. Charlton and L.M. Polvani, 2005: **On the meridional structure of annular modes**, *J. Climate* **18**, 2119–2122
47. P.J. Kushner and L.M. Polvani, 2005: **A Very Large, Spontaneous Stratospheric Sudden Warming in a Simple AGCM: A Prototype for the Southern-Hemisphere Warming of 2002?** *J. Atmos. Sci.* **62**, 890–897

#### 2004

46. L.M. Polvani, R.K. Scott and S.J. Thomas, 2004: **Numerically converged solutions of the global primitive equations for testing the dynamical core of atmospheric GCMs**, *Mon. Weather Rev.* **11**, 2539–2552
45. L.M. Polvani and D.W. Waugh, 2004: **Upwelling Wave Activity Flux as Precursor to Extreme Stratospheric Events and Subsequent Anomalous Surface Weather Regimes**, *J. Climate* **17**, 3548–3554
44. J. Galewsky, R.K. Scott and L.M. Polvani, 2004 : **An initial-value problem for testing numerical models of the global shallow water equations**, *Tellus A* **56**, 429–440  
and J. Galewsky, R.K. Scott and L.M. Polvani, 2006 : **Corrigendum**, *Tellus A* **56**, 520–522
43. M.A.H. Wittman, L.M. Polvani, R.K. Scott, and A.J. Charlton, 2004: **Stratospheric Influence on Baroclinic Lifecycles and its Connection to the Arctic Oscillation**, *Geophys. Res. Lett.* **31**

42. J.G. Esler and L.M. Polvani, 2004: **Kelvin-Helmholtz instability of potential vorticity layers. A route to mixing**, *J. Atmos. Sci.* **61**, 1392–1405
41. R.K. Scott and L.M. Polvani, 2004: **Stratospheric control of upward wave flux near the tropopause**, *Geophys. Res. Lett.* **31**
40. R.K. Scott, D.G. Dritschel, L.M. Polvani and D.W. Waugh, 2004: **Enhancement of Rossby wave breaking by steep potential vorticity gradients in the winter stratosphere**, *J. Atmos. Sci.* **61**, 904–918
39. P.J. Kushner and L.M. Polvani, 2004: **Stratosphere-Troposphere Coupling in a Relatively Simple AGCM: The Role of Eddies**, *J. Climate* **17**, 629–639

#### 2002

38. L.M. Polvani and P.J. Kushner, 2002: **Tropospheric response to stratospheric perturbations in a relatively simple general circulation model**, *Geophys. Res. Lett.* **29**,
37. L.M. Polvani and A. Sobel, 2002: **The Hadley circulation and the weak temperature gradient approximation**, *J. Atmos. Sci.* **59**, 1744–1752
36. L. Rivier, R. Loft and L.M. Polvani, 2002: **An efficient spectral dynamical core for distributed memory computers**, *Mon. Weather Rev.* **130**, 1384–1396

#### 2001

35. A. Sobel, J. Nilson and L.M. Polvani, 2001: **The weak temperature gradient and balanced tropical moisture waves**, *J. Atmos. Sci.* **58**, 3650–3665
34. M.H. Visbeck, J.W. Hurrell, L.M. Polvani and H.M. Cullen, 2001: **The North Atlantic oscillation: past, present, and future**, *Proc. Nat. Acad. Sci.* **98**, 12876–12877

#### 2000

33. D.W. Waugh and L.M. Polvani, 2000: **Climatology of intrusions into the tropical upper troposphere**, *Geophys. Res. Lett.* **27**, 3857–3860
32. L.M. Polvani and R. Saravanan, 2000: **The vertical structure of breaking Rossby waves in the polar wintertime stratosphere**, *J. Atmos. Sci.* **57**, 3663–3685
31. A. Kuo and L.M. Polvani, 2000: **Nonlinear geostrophic adjustment, asymmetry, and potential vorticity change**, *Phys. Fluids* **12**, 1087–1100
30. J.G. Esler, L.M. Polvani and R.A. Plumb, 2000: **The effect of a Hadley circulation on the propagation and reflection of planetary waves in a simple one-layer model**, *J. Atmos. Sci.* **57**, 1536–1556

#### 1999

29. J.G. Esler, L.M. Polvani and R.A. Plumb, 1999: **On the mix-down time of dynamically active potential vorticity filaments** *Geophys. Res. Lett.* **26**, 2953–2956
28. A. Kuo and L.M. Polvani, 1999: **Wave-vortex interaction in rotating shallow water. Part I. One space dimension**, *J. Fluid Mech.* **394**, 1–27

27. D.G. Dritschel, L.M. Polvani and A. Moheballojeh, 1999: **The semi-Lagrangian contour-advective algorithm for the shallow water equations**, *Mon. Weath. Rev.* **127**, 1551–1565
26. L.M. Polvani, J.G. Esler and R.A. Plumb, 1999: **Time variability and Simmons-Wallace-Branstator instability in a simple nonlinear one-layer model**, *J. Atmos. Sci.* **56**, 1445–1460

**1998**

25. M. DiBattista and L.M. Polvani, 1998: **Barotropic vortex pairs on a rotating sphere**, *J. Fluid Mech.* **358**, 107–133

**1997**

24. A. Kuo and L.M. Polvani, 1997: **The time-dependent fully-nonlinear Rossby adjustment problem**, *J. Phys. Ocean.* **27**, 1614–1634

**1996**

23. J. Cho and L.M. Polvani, 1996: **The morphogenesis of bands and zonal winds in the atmospheres of the giant outer planets**, *Science* **273**, 335–337
22. J. Cho and L.M. Polvani, 1996: **The formation of jets and vortices from freely-evolving shallow water turbulence on the surface of a sphere**, *Phys. Fluids* **8**, 1531–1552
21. L.M. Polvani, D. Waugh and R.A. Plumb, 1996: **On the subtropical edge of the stratospheric surf zone – Comments – Reply**, *J. Atmos. Sci.* **53**, 3772–3775
20. J. Cho and L.M. Polvani, 1996: **The robustness of self-organized zonal jets in unforced, turbulent vorticity fields**, in *Vortex Flows and Related Numerical Methods II, ESAIM Proceedings*, **1**, 447–462

**1995**

19. L.M. Polvani, D. Waugh and R.A. Plumb, 1995: **On the subtropical edge of the stratospheric surf zone**, *J. Atmos. Sci.* **52**, 1288–1309

**1994**

18. L.M. Polvani, J.C. McWilliams, M. Spall and R. Ford, 1994: **The coherent structures of shallow water turbulence: deformation radius effects, cyclone/anticyclone asymmetry and gravity wave generation**, *Chaos* **4**, 177–186
17. D.W. Waugh, L.M. Polvani and R.A. Plumb, 1994: **Nonlinear, barotropic response to localized topographic forcing: Rossby-wave breaking and the formation of a tropical surf-zone**, *J. Atmos. Sci.* **51**, 1401–1416

**1993**

16. L.M. Polvani and D.G. Dritschel, 1993: **Wave and vortex dynamics on the surface of the sphere**, *J. Fluid Mech.* **255**, 35–64

**1992**

15. D.G. Dritschel and L.M. Polvani, 1992: **The roll-up of vorticity strips on the surface of a sphere**, *J. Fluid Mech.* **234**, 47–69
14. L.M. Polvani and R.A. Plumb, 1992: **Rossby wave breaking, microbreaking, filamentation and secondary vortex formation: the dynamics of a perturbed vortex**, *J. Atmos. Sci.* **49**, 462–476

**1991**

13. L.M. Polvani and J. Touma, 1991: **A note on recent experiments with Rossby waves on eastward jets**, in *Nonlinear Phenomena in Atmospheric and Ocean Science*, G. Carnevale and R. Pierrehumbert, Eds.
12. L.M. Polvani, 1991: **Two-layer geostrophic vortex dynamics. Part II. Alignment and two-layer V-states**, *J. Fluid Mech.* **225**, 241–270

**1990**

11. L.M. Polvani, J. Wisdom, E. deJong and A. Ingersoll, 1990: **Simple dynamical models of Neptune's Great Dark Spot**, *Science* **249**, 1393–1398
10. L.M. Polvani, and J. Wisdom, 1990: **On chaotic flow around the Kida vortex**, in *Topological Aspects of Fluid Mechanics*, C.U.P., H.K.Moffat, Ed.
9. L.M. Polvani, and X.J. Carton, 1990: **The tripole: a new coherent vortex structure of inviscid two-dimensional flows**, *Geophys. Astrophys. Fluid Dyn.* **51**, 87–102
8. L.M. Polvani and J. Wisdom: **Chaotic Lagrangian trajectories around an elliptical vortex patch embedded in a constant and uniform background shear flow**, *Phys. Fluids A* **2**, 123–126

**1989**

7. L.M. Polvani, N.J. Zabusky and G.R. Flierl, 1989: **Two-layer geostrophic vortex dynamics. Part I. Upper-layer V-states and merger**, *J. Fluid Mech.* **205**, 215–242
6. L.M. Polvani, G.R. Flierl and N.J. Zabusky, 1989: **Filamentation of unstable vortex structures via separatrix crossing: a quantitative estimate of onset time**, *Phys. Fluids A* **1**, 181–184
5. X.J. Carton, G.R. Flierl and L.M. Polvani, 1989: **The generation of tripoles from unstable axisymmetric vortex structures**, *Europhys. Lett.* **9**, 339–344

**1988**

4. L.M. Polvani and J. Pedlosky, 1988: **The effect of dissipation on spatially growing nonlinear baroclinic waves**, *J. Atmos. Sci.* **45**, 1977–1989

**1987**

3. J. Pedlosky and L.M. Polvani, 1987: **Wave-wave interaction of unstable baroclinic waves**, *J. Atmos. Sci.* **44**, 631–647

**1986**

2. L.M. Polvani and G.R.Flierl, 1986: **Generalized Kirchhoff vortices**, *Phys. Fluids A* **29**, 2376–2379

**1982**

1. Y. Afek, B. Margolis and L.M. Polvani, 1982: **The production of heavy particles by protons on protons**, *Phys. Rev. D* **25**, 1833–1837

**2. Books edited:**

1. **The Stratosphere: Dynamics, Chemistry, and Transport**, *Geophys. Monogr. Ser.* **190**, L.M. Polvani, A.H. Sobel, and D.W. Waugh eds., 196 pp., AGU, Washington, DC (2010)

**3. Other publications:**

16. W.J. Randel, C. Covey, L.M. Polvani and A.K. Steiner: **Stratospheric temperature** [in State of the Climate in 2024], *Bull. Am. Meteor. Soc.* **106** (8), S41–S42 (2025)
15. W.J. Randel, C. Covey, L.M. Polvani and A.K. Steiner: **Stratospheric temperature** [in State of the Climate in 2023], *Bull. Am. Meteor. Soc.* **105** (8), S41–S42 (2024)
14. W.J. Randel, C. Covey, L.M. Polvani and A.K. Steiner: **Stratospheric temperature** [in State of the Climate in 2022], *Bull. Am. Meteor. Soc.* **104** (9), S38–S39 (2023)
13. W.J. Randel, C. Covey, L.M. Polvani and A.K. Steiner: **Stratospheric temperature** [in State of the Climate in 2021], *Bull. Am. Meteor. Soc.* **103** (8), S39–S41 (2022)
12. W.J. Randel, C. Covey and L.M. Polvani: **Stratospheric temperature** [in State of the Climate in 2020], *Bull. Am. Meteor. Soc.* **102** (8), S37–S38 (2021)
11. G.G. Pfister and 27 co-authors (including L.M. Polvani): **The Multi-Scale Infrastructure for Chemistry and Aerosols (MUSICA)**, *Bull. Am. Meteor. Soc.* **101** (10), E1743–E1760 (2020)
10. W.J. Randel, C. Covey and L.M. Polvani: **Stratospheric temperature** [in State of the Climate in 2019], *Bull. Am. Meteor. Soc.* **101** (8), S32–S34 (2020)
9. L.M. Polvani, A. Clement, B. Medeiros, J.J. Benedict, and I.R. Simpson: **When less is more: Opening the door to simpler climate models**, *EOS* **99** (3), 15–16 (2018)
8. D.W. Waugh, A.H. Sobel and L.M. Polvani: **What is the polar vortex and how does it influence weather?** *Bull. Am. Meteor. Soc.* **98**, 37–44 (2017)
7. T.J. Bracegirdle and 18 co-authors (including L.M. Polvani): **A multi-disciplinary perspective on climate model evaluation for Antarctica**, *Bull. Am. Meteor. Soc.* **97**, ES23–ES26 (2016)
6. J.E. Kay and 19 co-authors (including L.M. Polvani): **The Community Earth System Model (CESM) Large Ensemble Project: A Community Resource for Studying Climate Change in the Presence of Internal Climate Variability**, *Bull. Am. Meteor. Soc.* **96**, 1333–1349 (2015)

5. J.M. Arblaster, N.P. Gillet, N. Calvo, P.M. Forster L.M. Polvani, S.-W. Son, D.W. Waugh and P.J. Young: **Stratospheric Ozone Changes and Climate**, Chapter 4 in *Scientific Assessment of Ozone Depletion: 2014*, Global Ozone Res. and Monit. Proj. Report No. 55, WMO, Geneva, Switzerland (2014)
4. E.P. Gerber and 13 co-authors (including L.M. Polvani): **Assessing and understanding the impact of stratospheric dynamics and variability on the Earth system**, *Bull. Am. Meteor. Soc.* **93**, 845–859 (2012)
3. M.P. Chipperfield, V. Fioletov and 18 co-authors (including L.M. Polvani): **Global Ozone Past and Present**, Ch. 3 of *Scientific Assessment of Ozone Depletion: 2006*, Global Ozone Res. and Monit. Proj, Report No. 50, WMO, Geneva, Switzerland (2007)
2. R.K. Scott, L. Rivier, R. Loft and L.M. Polvani: **BOB (Built-On-Beowulf): model implementation and users guide**, *NCAR Technical Note TN-456+IA* (2004)
1. L.M. Polvani: **The linear instability of continuous heton band clouds**, *GFD Summer Study Program 1984*, Woods Hole Ocean. Inst. Tech. Rep. WHOI-84-44 (1984)