

LANTAO SUN

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EDUCATION

August 2010 Ph.D., University of Illinois at Urbana-Champaign
 Advisor: *W. A. Robinson*; Area: *Stratospheric dynamics*
May 2005 and 2002 M.S. and B.S. Peking University, Beijing, China

RESEARCH INTEREST

- Arctic sea ice loss and its impact
- Stratosphere-troposphere coupling
- Climate variability and climate change
- Subseasonal to seasonal (S2S) forecast

PROFESSIONAL EXPERIENCE

CIRES, CU-Boulder and NOAA/ESRL/PSD, Boulder, CO
2017-present: Research Scientist II
2015-2016: Research Scientist I
National Center for Atmospheric Research, Boulder, CO
2013-2015: Postdoctoral Associate
Cornell University, Ithaca, NY
2010-2013: Postdoctoral Fellow
University of Illinois at Urbana-Champaign, Urbana, IL
2005 - 2009: Research Assistant
Peking University, Beijing, China
2002 - 2005: Research Assistant

SERVICES AND OUTREACH

- Member of American Geophysical Union and American Meteorological Society (2007-present); Steering committee of Stratospheric Network for the Assessment of Predictability (2017-present); Member of NOAA subseasonal to seasonal prediction task force (2016-2019); Organizing committee of SPARC Region Workshop on “Chemical and Physical Processes in the Climate System” (2015); Judge for Outstanding Student Paper Awards at AGU fall meeting (2016).
- Reviewer for journals: *Nature*; *Nature Climate change*; *Nature Communication*; *Proceedings of the National Academy of Sciences*; *Bulletin of the American Meteorological Society*; *Scientific Report*; *Journal of Climate*; *Climate Dynamics*; *Geophysical Research Letters*; *Environmental Research Letters*; *Journal of Geophysical Research: Atmospheres*; *Journal of the Atmospheric Sciences*; *International Journal of climatology*; *Journal of Atmospheric and Solar-Terrestrial Physics*; *The Acta Meteorologica Sinica*; *Advance in Atmospheric Sciences*. Reviewer for proposal: *the Knut and Alice Wallenberg Foundation*.

GOOGLE SCHOLAR

<https://scholar.google.com/citations?user=qtsbKdUAAAJ&hl=en>

RESEARCH GRANTS

2016-2019: Role of stratospheric processes in predicting ENSO-NAO connections on subseasonal time scale (Co-Investigator), NOAA Climate Program Office.

SELECTED PUBLICATIONS (*reversed order*)

28. Sun, L., M. Alexander, and C. Deser, 2018: Evolution of the global coupled climate response to Arctic sea ice loss during 1990-2090 and its contribution to climate change, *J. Climate*, 31, 7823-7843, doi: 10.1175/JCLI-D-18-0134.1.
27. Wang, K., C. Deser, L. Sun and R. Tomas, 2018: Fast response of the tropics to an abrupt loss of Arctic sea ice via ocean dynamics, *Geophys. Res. Lett.*, 45, doi: 10.1029/2018GL077325.
26. England, M., L. Polvani and L. Sun, 2018: Contrasting the Antarctic and Arctic atmospheric responses to projected sea ice loss in the late 21st Century, *J. Climate*, 31, 6353-6370, doi: 10.1175/JCLI-D-17-0666.1.
25. Screen, J., C. Deser, D. M. Smith, X. Zhang, R. Blackport, P. J. Kushner, T. Oudar, K. E. McCusker and L. Sun, 2018: Elucidating the effects of Arctic sea ice loss on Northern Hemisphere climate, *Nature Geo.*, doi:10.1038/s41561-018-0059-y.
24. Perlwitz, J., L. Sun, J. Richter, and J. Albers, 2018: How strong is the relationship between the Quasi-biennial Oscillation and Northern Hemisphere extratropical circulation? *Geophys. Res. Lett.*, In revision.
23. Sun, L., D. Allured, M. Hoerling, L. Smith, J. Perlwitz, and D. Murray, 2018: Drivers of 2016 record Arctic warmth assessed using climate simulations subjected to factual and counterfactual forcing, *Weather and Climate Extremes*, 19, 1-9, doi: 10.1016/j.wace.2017.11.001.
22. Xue, D., J. Lu, L. Sun, G. Chen and Y. Zhang, 2017: Local increase of anti-cyclonic wave activity over Northern Eurasia under amplified Arctic warming, *Geophys. Res. Lett.*, 44, doi:10.1002/2017GL072649.
21. Polvani, L., 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. doi:10.1175/JCLI-D-16-0277.1.
20. Burrows, D. A., G. Chen and L. Sun, 2017: Barotropic and Baroclinic Eddy Feedbacks in the Midlatitude Jet Variability and Responses to Climate Change-Like Thermal Forcings, *J. Atmos. Sci.* 74, 111-132. doi:10.1175/JAS-D-16-0047.1.
19. Sun, L., J. Perlwitz and M. Hoerling, 2016: What caused the recent "Warm Arctic, Cold Continents" trend pattern in winter temperatures? *Geophys. Res. Lett.*, doi: 10.1002/2016GL069024.
18. Deser, C., L. Sun, R. A. Tomas and J. Screen, 2016: Does ocean-coupling matter for the northern extra-tropical response to projected Arctic sea ice loss? *Geophys. Res. Lett.*, doi:10.1002/2016GL067792.

17. Tomas, R. A., C. Deser and **L. Sun**, 2016: The role of ocean heat transport in the global climate response to projected Arctic sea ice loss, *J. Climate*. doi: 10.1175/JCLI-D-15-0651.1.
16. **Sun, L.**, C. Deser and R. A. Tomas, 2015: Mechanisms of stratospheric and tropospheric circulation response to projected Arctic sea ice loss. *J. Climate*, **28**, 7824–7845. doi: <http://dx.doi.org/10.1175/JCLI-D-15-0169.1>
15. Yang, H., **L. Sun** and G. Chen, 2015: Separating transient responses to stratospheric ozone depletion-like springtime cooling in an idealized atmospheric model, *J. Atmos. Sci.*, **72**, 763–773. doi: 10.1175/JAS-D-13-0353.1.
14. Richter, J. H., C. Deser and **L. Sun**, 2015: Effects of stratospheric variability on El Niño teleconnections, *Environ. Res. Lett.*, doi:10.1088/1748-9326/10/12/124021.
13. Deser, C., R. A. Tomas and **L. Sun**, 2015: The role of ocean-atmosphere coupling in the zonal-mean atmospheric response to Arctic sea ice loss. *J. Climate*, **28**, 2168–2186. doi: <http://dx.doi.org/10.1175/JCLI-D-14-00325.1>.
12. Screen, J. A., C. Deser and **L. Sun**, 2015: Projected changes in regional climate extremes arising from Arctic sea ice loss. *Environ. Res. Lett.*, **10**, 084006 doi: 10.1088/1748-9326/10/8/084006.
11. Screen, J. A., C. Deser and **L. Sun**, 2015: Reduced risk of North American cold extremes due to continued sea ice loss. *Bull. Amer. Met. Soc.*, **96**, 1489–1503. doi: <http://dx.doi.org/10.1175/BAMS-D-14-00185.1>.
10. **Sun, L.**, C. Deser, L. Polvani and R. A. Tomas, 2014: Influence of projected Arctic sea ice loss on polar stratospheric ozone and circulation in spring, *Environ. Res. Lett.*, **9** 084016, doi:10.1088/1748 9326/9/8/084016.
9. **Sun, L.**, G. Chen and W. A. Robinson, 2014: The role of stratospheric polar vortex breakdown in Southern Hemisphere climate trends, *J. Atmos. Sci.*, **71**, 2335–2353. doi:10.1175/JAS-D-13-0290.1.
8. Lu, J., **L. Sun**, Y. Wu and G. Chen, 2014: The role of irreversible PV mixing in the zonal mean circulation response to global warming-like thermal forcing, *J. Climate*, **27**, 2297–2316, doi:10.1175/JCLI-D-13-00372.1.
7. **Sun, L.**, G. Chen and J. Lu, 2013: Sensitivities and mechanisms of the zonal mean atmospheric circulation responses to tropical warming, *J. Atmos. Sci.*, **70**, 2487–2504, doi:10.1175/JAS-D-12-0298.1.
6. Domeisen, D., **L. Sun** and G. Chen, 2013: The role of synoptic eddies in the tropospheric response to stratospheric variability. *Geophys. Res. Lett.*, **40**, 49334937, doi:10.1002/grl.50943.
5. Chen, G., J. Lu, **L. Sun**, 2013: Delineating the Eddy-Zonal Flow Interaction in the Atmospheric Circulation Response to Climate Forcing: Uniform SST Warming in an Idealized Aqua-planet Model. *J. Atmos. Sci.*, **70**, 2214–2233, doi:10.1175/JAS-D-12-0248.1.
4. **Sun, L.**, W. A. Robinson and G. Chen, 2012: The predictability of stratospheric warming events: more from the troposphere or the stratosphere? *J. Atmos. Sci.*, **69**, 768–783, doi:10.1175/JAS-D-11-0144.1.
3. Chen, G. and **L. Sun**, 2011: Mechanisms of the tropical upwelling branch of the Brewer-Dobson Circulation: the role of extratropical waves. *J. Atmos. Sci.*, **68**, 2878–2892, doi:10.1175/JAS-D-11-044.1.

2. **Sun, L.**, W. A. Robinson and G. Chen, 2011: The role of planetary waves in the downward influence of stratospheric final warming events. *J. Atmos. Sci.*, **68**, 2826-2843, doi:10.1175/JAS-D-11-014.1.
1. **Sun, L.** and W. A. Robinson, 2009: Downward influence of stratospheric final warming events in an idealized model, *Geophys. Res. Lett.*, **36**, L03819, doi:10.1029/2008GL036624.

Ph.D. Thesis

Sun, L., 2010: Downward influence of stratospheric final warming events in an idealized model. Ph.D. thesis, University of Illinois at Urbana-Champaign, 133pp.

CONFERENCE PRESENTATIONS AND SEMINARS (*reversed order*)

31. Apr 2018: NOAA Physical Sciences Division Flash Seminar, Boulder, CO
 - Title: Evolution of the global coupled climate response to Arctic sea ice loss during 1990-2090 and its contribution to climate change.
30. Jun 2017: Aspen Global Change Institute workshop on “Understanding the Causes and Consequences of Polar Amplification”, Aspen, CO
 - (Talk): **Sun L.** and M. Alexander: Global climate response to projected transient Arctic sea ice loss.
 - (Poster): **Sun, L.**, J. Perlwitz, L. Smith and M. Hoerling: Drivers of polar stratospheric circulation during recent low Arctic sea ice years.
 - (Talk): Hoerling, M., **L. Sun** and J. Perlwitz: In search of teleconnections forced by Arctic amplification.
 - (Poster): England, M., L. Polvani and **L. Sun**: The effect of future Antarctic sea ice loss on Southern Hemisphere circulation
 - (Talk): Wang, K, C. Deser, R. Tomas, and **L. Sun**: Fast response of the tropical Pacific to abrupt Arctic sea ice loss via ocean dynamics
29. Mar 2017: Climate Variability & Change Working Group Meeting, Boulder, CO
 - (Talk): **Sun, L.** and M. Alexander: The impact of projected transient Arctic sea ice loss on Northern Hemisphere climate.
28. Dec 2016: AGU Fall Meeting, San Francisco, CA
 - (Talk): **Sun, L.**, J. Perlwitz and J. H. Richter: Role of stratospheric processes on ENSO-NAO connections on Seasonal-to-Subseasonal timescale.
 - (Talk): Alexander, M. and **L. Sun**: The impact of projected transient Arctic sea ice loss on Northern Hemisphere climate. Sun, Lantao, Judith Perlwitz and Martin Hoerling: What caused the recent “Warm Arctic, Cold Continents” trend pattern in winter temperatures
27. Jul 2016: Invited U.S. CLIVAR Webinar
 - Title: What caused the recent “Warm Arctic, Cold Continents” winter temperature trend pattern?
26. Apr 2016: Intl. Arctic Systems for Observing the Atmos. (IASOA) Telecon
 - Title: What caused the recent “Warm Arctic, Cold Continents” winter temperature trend pattern?
25. Mar 2016: NOAA Physical Sciences Division Flash Seminar, Boulder, CO
 - Title: What caused the recent “Warm Arctic, Cold Continents” winter temperature trend pattern?
24. Feb 2016: Climate Variability & Change Working Group Meeting, Boulder, CO
 - (Talk): **Sun, L.**, J. Perlwitz and M. Hoerling: What caused the recent “Warm Arctic, Cold Continents” winter temperature trend pattern?
23. Nov 2015: SPARC Regional Workshop, Boulder, CO
 - (Talk): **Sun, L.**, J. H. Richter and C. Deser and J. Perlwitz: How much can raising model lid improve the stratospheric and tropospheric simulation?
 - (Talk): Richter, J. H., C. Deser and **L. Sun**: Effects of the stratosphere on El Niño teleconnections
22. Oct 2015: NOAA Climate Diagnostic and Prediction Workshop, Denver, CO

- (Talk): **Sun, L.**, J. Perlwitz and M. Hoerling: What caused the recent “Warm Arctic, Cold Continents” winter temperature trend pattern?
21. Sep 2015: Seminar at GFDL, Princeton, NJ
 - Title: Modeling the impact of current and future Arctic sea ice loss on the atmosphere.
 20. Jun 2015: CESM Workshop, Breckenridge, CO
 - (Talk): **Sun, L.**, C. Deser and R. A. Tomas: Does autumn sea ice loss affect winter and spring atmospheric circulation?
 19. Feb 2015: Invited Seminar at Cornell University, Ithaca, NY
 - Title: Atmospheric circulation and surface climate response to projected Arctic sea ice loss.
 18. Jan 2015: AMS Conference, Phoenix, AZ
 - (Talk): **Sun, L.**, L. M. Polvani and C. Deser: The importance of the stratospheric pathway of El Niño-Southern-Oscillation teleconnections: a modeling study with WACCM.
 - (Talk): **Sun, L.**, C. Deser, R. A. Tomas and L. Polvani: Sensitivity of stratospheric circulation response to different geographic locations of the Arctic sea ice.
 - (Poster): Burrows, D. A., G. Chen and **L. Sun**: Quantifying the Barotropic and Baroclinic Mechanisms in the Persistence of Annular Modes.
 17. Dec 2014: Intl. Workshop on polar-lower latitude linkages, Barcelona, Spain
 - (Poster): **Sun, L.**, C. Deser and R. A. Tomas and L. Polvani: Atmospheric circulation response to projected Arctic sea ice loss in WACCM.
 16. Oct 2014: NCAR Climate Global Dynamics Seminar, Boulder, CO
 - Title: Atmospheric circulation and surface climate response to projected Arctic sea ice loss.
 15. Sep 2014: NOAA Physical Sciences Division Seminar, Boulder, CO
 - Title: Atmospheric circulation and surface climate response to projected Arctic sea ice loss.
 14. May 2014: Seminar at Colorado State University, Fort Collins, CO
 - Title: Impact of future Arctic sea ice loss on the troposphere and stratosphere.
 13. Apr 2014: Seminar at Ball Aerospace Company, Boulder, CO
 - Title: ozone and the stratosphere.
 12. Jun 2014: CESM Workshop, Breckenridge, CO
 - (Talk): **Sun, L.**, C. Deser, R. A. Tomas and L. Polvani: Impact of future Arctic sea ice loss on the troposphere and stratosphere.
 11. Mar 2014: Climate Variability & Change Working Group Meeting, Boulder, CO
 - (Talk): **Sun, L.**, C. Deser and R. A. Tomas: On the atmospheric circulation response to Arctic sea ice loss.
 10. Dec 2013: AGU Fall Meeting, San Francisco, CA
 - (Talk): **Sun, L.**, C. Deser, R. A. Tomas and L. Polvani: Arctic ozone reduction associated with projected sea ice loss.
 - (Poster): **Sun, L.**, G. Chen and W. A. Robinson: Tropospheric response to an ozone depletion-like polar stratospheric cooling.
 9. Sep 2013: NCAR Climate Global Dynamics Research Report
 - Title: Arctic spring ozone reduction associated with projected sea ice loss
 8. Dec 2012: AGU Fall Meeting, San Francisco, CA
 - (Poster): **Sun, L.**, G. Chen and J. Lu: Sensitivities and mechanisms of the zonal mean atmospheric circulation responses to tropical warming.
 - (Poster): **Sun, L.**, G. Chen and W. A. Robinson: The role of stratospheric polar vortex breakdown in Southern Hemisphere climate trends.
 7. Nov 2012: Invited Seminar at MIT, Cambridge, MA
 - Title: The predictability of stratospheric warming events: more from the troposphere or the stratosphere?
 6. Oct 2012: WCRP Open Science Conference, Denver, CO
 - (Poster): **Sun, L.**, G. Chen and W. A. Robinson: The role of stratospheric polar vortex breakdown in Southern Hemisphere climate trends.

5. Sep 2012: Invited Seminar at Stony Brook University, Stony Brook, NY
 - Title: The predictability of stratospheric warming events: more from the troposphere or the stratosphere?
4. Jan 2011: AMS Conference, Seattle, WA
 - (Talk): **Sun, L.**, W. A. Robinson and G. Chen: The role of planetary waves in the downward influence of stratospheric final warming events.
 - (Poster): **Sun, L.**, W. A. Robinson and G. Chen: The predictability of stratospheric warming events: more from the troposphere or the stratosphere?
3. Feb 2010: Seminar at University of Illinois at Urbana-Champaign, Urbana, IL
 - Title: Downward Influence of Stratospheric Final Warming Events In An Idealized Model.
2. Jun 2009: 15th Conference on Middle Atmosphere, Stowe, VT
 - (Poster): **Sun, L.**, W. A. Robinson: Downward influence of stratospheric final warming events in an idealized model.
1. Sep 2007: Chapman Conference on Middle Atmosphere, Santorini, Greece
 - (Talk): **Sun, L.**, W. A. Robinson: Modeling the downward influence of stratospheric final warming events.