

DAEHYUN KIM

Department of Atmospheric Sciences, Box 351640
University of Washington, Seattle, WA 98195-1640
E-mail: daehyun@uw.edu Phone: 206-221-8935
Website: <http://www.atmos.washington.edu/~daehyun>

Research Interests

- Climate dynamics, Climate modeling, Cloud physics, Cumulus parameterization

Education

- 2003 B.S. in Atmospheric Sciences, Seoul National University, Seoul
- 2010 Ph.D. in Atmospheric Sciences, Seoul National University, Seoul
 - Thesis title: "Development of a Bulk Mass Flux Convection Scheme and Its Impacts on Simulation of the Madden-Julian Oscillation"
 - Advisor: Prof. In-Sik Kang, Seoul National University

Employment

- 2010-2012 Postdoctoral Research Scientist, Lamont-Doherty Earth Observatory of Columbia University, New York, NY
 - Advisors: Prof. Adam H. Sobel (Columbia Univ.) and Dr. Anthony D. Del Genio (GISS/NASA)
- 2012-2014 Lamont Assistant Research Professor, Lamont-Doherty Earth Observatory of Columbia University, New York, NY
- 2014-present Assistant Professor, Department of Atmospheric Sciences, University of Washington, Seattle, WA

Honors and Awards

- 2002 The 3rd place, National Undergraduate Student Science Paper Contest
- 2010 Best Thesis Award, Seoul National University SPARC
- 2012 American Geophysical Union James R. Holton Junior Scientist Award

Professional Services

- 2013-present Member, WMO WGNE MJO Task Force (MJO TF)
- 2009-2012 Member, WMO WCRP/WWRP-THORPEX, YoTC MJO TF
- 2006-2009 Member, US CLIVAR MJO Working Group

Research Grants

Intraseasonal variability and tropical cyclones in the NASA GISS general circulation model: phase 2, co-PI, NASA, 2013-2017.

Evaluation of land processes and land-atmosphere interactions represented in GloSea climate model, PI, CATER, June 2014-May 2015.

Tropical cyclones and climate - a model intercomparison project, co-PI, NSF, 2012-2014.

Peer-reviewed Publications

- Adames, Á. F., and **D. Kim**: The MJO as a dispersive, convectively coupled moisture wave: observations and theory. *J. Atmos. Sci.*, Accepted.
- Field, R., M. Luo, **D. Kim**, A. D. Del Genio, A. Voulgarakis, J. Worden, 2015: Sensitivity of simulated tropospheric CO to subgrid physics parameterization: a case study of Indonesian biomass burning emissions in 2006. *J. Geophys. Res.*, 120, 11743-11759, doi:10.1002/2015JD023402.
- Daleu, C., S. Woolnough, R. Plant, S. Sessions, M. Herman, A. Sobel, S. Wang, **D. Kim**, A. Cheng, G. Bellon, P. Peyrille, F. Ferry, A. Siebesma, B. van Ulfert, 2015: Intercomparison of methods of coupling between convection and large-scale circulation. Part I: Comparison over uniform surface condition. *J. Adv. Model. Earth Syst.*, 7, doi:10.1002/2015MS000468.
- Yoo, C., S. Park, **D. Kim**, J. Yoon, and H.-M. Kim, 2015: Boreal winter MJO teleconnection in the Community Atmospheric Model version 5 with the Unified Convection parameterization, *J. Climate*, Accepted.
- Kim, D.**, M.-S. Ahn, I.-S. Kang, and A. D. Del Genio, 2015: Role of longwave cloud-radiation feedback in the simulation of the Madden-Julian oscillation. *J. Climate*, 28, 6979-6994.
- Del Genio, A. D., J. Wu, A. B. Wolf, Y. Chen, M.-S. Yao, and **D. Kim**, 2015: Constraints on cumulus parameterization from simulations of observed MJO events. *J. Climate*, 28, 6419-6442.
- Del Genio, A. D., Y. Chen, **D. Kim**, and M.-S. Yao, 2015: CORRIGENDUM. *J. Climate*, 28, 5471-5473.
- Xavier, P. K., J. Petch, N. Klingaman, S. Woolnough, X. Jiang, D. Waliser, M. Caian, J. Cole, S. Hagos, C. Hannay, **D. Kim**, T. Miyakawa, M. Pritchard, R. Roehrig, E. Shindo, F. Vitart, and H. Wang, 2015: Vertical structure and diabatic processes of the Madden-Julian Oscillation: Biases and uncertainties at short range. *J. Geophys. Res.*, 120, 4749-4763.
- Klingaman, N. P., S. Woolnough, X. Jiang, D. Waliser, P. Xavier, J. Petch, M. Caian, C. Hannay, **D. Kim**, H.-Y. Ma, W. Merryfield, T. Miyakawa, M. Pritchard, J. Ridout, R. Roehrig, E. Shindo, F. Vitart, H. Wang, N. Cavanaugh, B. Mapes, A. Shelly, and G. Zhang, 2015: Vertical structure and physical processes of the Madden-Julian oscillation: Linking hindcast fidelity to simulated diabatic heating and moistening. *J. Geophys. Res.*, 120, 4690-4717.
- Jiang, X., D. Waliser, P. Xavier, J. Petch, N. Klingaman, S. Woolnough, B. Guan, G. Bellon, T. Crueger, C. DeMott, C. Hannay, H. Lin, W. Hu, **D. Kim**, C.-L. Lappen, M.-M. Lu, H.-Y. Ma, T. Miyakawa, J. Ridout, S. Schubert, J. Scinocca, K.-H. Seo, E. Shindo, X. Song, C. Stan, W.-L. Tseng, W. Wang, T. Wu, X. Wu, K. Wyser, G. Zhang, and H. Zhu, 2015: Vertical Structure and Physical Processes of the Madden-Julian Oscillation: Exploring Key Model Physics in Climate Simulations. *J. Geophys. Res.*, 120, 4718-4748.
- Daloz, A. S., S. Camargo, J. Kossin, K. Emanuel, M. Horn, J. Jonas, **D. Kim**, T. LaRow, Y.-K. Lim, C. Patricola, M. Roberts, E. Scoccimarro, P. Vidale, M. Wehner, D. Shaevitz, H. Wang, and M. Zhao, 2015: Cluster analysis of explicitly and downscaled simulated North Atlantic tropical cyclone tracks. *J. Climate*, 28, 1333-1361.

- Shaevitz, D., S. Camargo, A. Sobel, J. Jonas, **D. Kim**, A. Kumar, T. LaRow, Y.-K. Lim, H. Murakami, K. Reed, M. Roberts, E. Scoccimarro, P. Vidale, H. Wang, M. Wehner, D. Shaevitz, M. Zhao, and N. Henderson, 2014: Characteristics of tropical cyclones in high-resolution models in the present climate, *J. Adv. Model. Earth Syst.*, **6**, 1154–1172.
- Field, R. D., **D. Kim**, A. N. LeGrande, J. Worden, M. Kelley, G. A. Schmidt, 2014: Evaluating climate model performance in the tropics with retrievals of water isotopic composition from Aura TES. *Geophys. Res. Lett.*, **41**, 6030–6036.
- Kang, D., M.-I. Lee, J. Im, **D. Kim**, H.-M. Kim, H.-S. Kang, S. D. Schubert, A. Arribas, and C. MacLachlan, 2014: Prediction of the Arctic Oscillation in Boreal Winter by Dynamical Seasonal Forecasting Systems. *Geophys. Res. Lett.* **41**, 3577–3585.
- Sobel, A. H., S. Wang, and **D. Kim**, 2014: Moist static energy budget of the MJO during DYNAMO. *J. Atmos. Sci.*, **71**, 4276–4291.
- Kim, D.**, P. Xavier, E. Maloney, M. Wheeler, D. Waliser, K. Sperber, H. Hendon, C. Zhang, R. Neale, Y.-T. Hwang, H. Liu, 2014: Process-oriented MJO simulation diagnostic: Moisture sensitivity of simulated convection. *J. Climate*, **27**, 5379–5395.
- Wang, H., and coauthors, 2014: How Well Do Global Climate Models Simulate the Variability of Atlantic Tropical Cyclones Associated with ENSO? *J. Climate*, **27**, 5673–5692.
- Kim, H.-M., P. J. Webster, V. E. Toma, and **D. Kim**, 2014: Predictability and prediction skill of the MJO in two operational forecasting systems, *J. Climate*, **27**, 5364–5378.
- Kim, D., M.-I. Lee, **D. Kim**, S. D. Schubert, D. E. Waliser, and B. Tian, 2014: Representation of tropical subseasonal variability of precipitation in global reanalyses. *Clim. Dyn.*, **43**, 517–534.
- Lee, M.-I., H.-S. Kang, **D. Kim**, D. Kim, H. Kim, and D. Kang, 2014: Validation of the experimental hindcasts produced by the GloSea4 seasonal prediction system. *Asia-Pacific J. Atmos. Sci.*, **50**, 307–326.
- Kim, D.**, J.-S. Kug, and A. H. Sobel, 2014: Propagating vs. Non-propagating Madden-Julian oscillation events. *J. Climate*, **27**, 111–125.
- Wilson, E. A., A. L. Gordon, and **D. Kim**, 2013: Observations of the Indian Ocean dipole on the Madden-Julian events. *J. Geophys. Res.*, **118**, 2588–2599.
- Hung, M.-P., J.-L. Lin, W. Wang, **D. Kim**, T. Shinoda, and S. J. Weaver, 2013: MJO and convectively coupled equatorial waves simulated by CMIP5 climate models, *J. Climate*, **26**, 6185–6214.
- Kim, D.**, A. D. Del Genio, and M. S. Yao, 2013: Moist convection scheme in Model E2. Rep., arXiv:1312. 7496 pp.
- Jang, Y.-S., **D. Kim**, Y.-H. Kim, D.-H. Kim, M. Watanabe, F.-F. Jin, and J.-S. Kug, 2013: Simulation of two types of El Nino from different convective parameters. *Asia-Pacific J. Atmos. Sci.*, **49**, 193–199.
- Ham, Y.-G., J.-S. Kug, **D. Kim**, Y.-H. Kim, and D.-H. Kim, 2013: What controls phase-locking of ENSO to boreal winter in coupled GCMs? *Clim. Dyn.*, **40**, 1551–1568.

- Linter, B. R., G. Bellon, A. H. Sobel, **D. Kim**, and D. J. Neelin, 2012: Implementation of the Quasi-equilibrium Tropical Circulation Model2 (QTCM2): Global simulations and convective sensitivity to free tropospheric moisture. *J. Adv. Model. Earth Syst.*, 4, M12002.
- Sobel, A. H., and **D. Kim**, 2012: The MJO-Kelvin wave transition. *Geophys. Res. Lett.*, 39, L20808.
- Ramsay, H. A., S. Camargo, and **D. Kim**, 2012: Cluster analysis of tropical cyclone tracks in the Southern Hemisphere. *Clim. Dyn.*, 39, 897-917.
- Jiang, X., D. E. Waliser, **D. Kim**, M. Zhao, K. R. Sperber, W. Stern, S. D. Schubert, G. Zhang, W. Wang, M. Khairoutdinov, R. Neale, and M.-I. Lee, 2012: Simulation of the intraseasonal variability over the eastern Pacific ITCZ in climate models. *Clim. Dyn.*, 39, 617-636.
- Ham, Y.-G., I.-S. Kang, **D. Kim**, and J.-S. Kug, 2012: El-Nino Southern Oscillation simulated and predicted in the SNU coupled GCMs. *Clim. Dyn.*, 38, 2227-2242.
- Kim, D.**, A. H. Sobel, A. D. Del Genio, Y. Chen, S. J. Camargo, M.-S. Yao, M. Kelley, and L. Nazarenko, 2012: Tropical subseasonal variability simulated in the NASA GISS general circulation model. *J. Climate*, 25, 4641-4659.
- Sperber, K. R. and **D. Kim**, 2012: Simplified metrics for the identification of the Madden-Julian oscillation in models. *Atmos. Res. Lett.*, 13, 187-193.
- Del Genio, A. D., Y. Chen, **D. Kim**, and M.-S. Yao, 2012: The MJO transition from shallow to deep convection in CloudSat/CALIPSO data and GISS GCM simulations. *J. Climate*, 25, 3775-3770.
- Kim, D.** and I.-S. Kang, 2012: A bulk mass flux convection scheme for climate model - Description and moisture sensitivity. *Clim. Dyn.*, 38, 411-429.
- Kim, D.**, Y.-S. Jang, D.-H. Kim, Y.-H. Kim, M. Watanabe, F.-F. Jin, and J.-S. Kug, 2011: ENSO sensitivity to cumulus entrainment in a coupled GCM. *J. Geophys. Res.*, 116, D22112.
- Kim, D.**, A. H. Sobel, and I.-S. Kang, 2011: A mechanism denial study on the Madden-Julian Oscillation. *J. Adv. Model. Earth Syst.*, 3, M12007.
- Kim, D.**, A. H. Sobel, D. M. W. Frierson, E. D. Maloney, and I.-S. Kang, 2011: A systematic relationship between intraseasonal variability and mean state bias in AGCM simulations. *J. Climate*, 24, 5506-5520.
- Kug, J.-S., K. P. Sooraj, and F.-F. Jin, Y.-G. Ham, and **D. Kim**, 2011: A possible mechanism for El Nino-like warming in response to the future greenhouse warming. *Int. J. Climatol.*, 31, 1567-1572.
- Frierson, D. M. W., **D. Kim**, I.-S. Kang, M.-I. Lee, and J. L. Lin, 2011: Structure of AGCM-simulated convectively coupled Kelvin waves and sensitivity to convective parameterization. *J. Atmos. Sci.*, 68, 26-45.
- Kang, I.-S., **D. Kim**, and J.-S. Kug, 2010: Mechanism for northward propagation of boreal summer intraseasonal oscillation: Convective momentum transport. *Geophys. Res. Lett.*, 37, L24804.
- Kim, D.**, K. Sperber, W. Stern, D. Waliser, I.-S. Kang, E. Maloney, W. Wang, K. Weickmann, J. Benedict, M. Khairoutdinov, M.-I. Lee, R. Neale, M. Suarez, K.

Thayer-Calder, and G. Zhang, 2009: Application of MJO simulation diagnostics to climate models. *J. Climate*, 22, 6413-6436.

CLIVAR Madden-Julian Oscillation Working Group; D. Waliser, K. Sperber, H. Hendon, **D. Kim**, E. Maloney, M. Wheeler, K. Weickmann, C. Zhang, L. Donner, J. Gottschalck, W. Higgins, I.-S. Kang, D. Legler, M. Moncrieff, S. Schubert, W. Stern, F. Vitart, B. Wang, W. Wang, S. Woolnough, 2009: MJO simulation diagnostics. *J. Climate*, 22, 3006-3030.

Sooraj, K. P., **D. Kim**, J.-S. Kug, S.-W. Yeh, F.-F. Jin and I.-S. Kang, 2009: Effects of the low-frequency zonal wind variation on the high frequency atmospheric variability over the tropics. *Clim. Dyn.*, 33, 495-507.

Liu, P., Y. Kajikawa, B. Wang, A. Kitoh, T. Yasutari. T. Li, H. Annamalai, X. Fu, K. Kukuchi, R. Mizuta, K. Rajendran, D. E. Waliser and **D. Kim**, 2009: Tropical intraseasonal variability in the MRI-20km60L AGCM. *J. Climate*, 22, 2006-2022

Kug, J.-S., K. P. Sooraj, **D. Kim**, I.-S. Kang, F.-F. Jin, Y. N. Takayabu, M. Kimoto, 2009: Simulation of state-dependent high-frequency atmospheric variability associated with ENSO. *Clim. Dyn.*, 32, 635-648.

Lee, M.-I., M. J. Suarez, I.-S. Kang, I. M. Held and **D. Kim**, 2008: A moist benchmark calculation for the atmospheric general circulation models. *J. Climate*, 21, 4934-4954.

Kim, D., J.-S. Kug, I.-S. Kang, F.-F. Jin, and A. Wittenberg, 2008: Tropical Pacific impacts of convective momentum transport in the SNU coupled GCM. *Clim. Dyn.*, 31, 213-226.

Lin, J. L., M.-I. Lee, **D. Kim**, I.-S. Kang, and D. Frierson, 2008: The impacts of convective parameterization and moisture triggering on AGCM-simulated convectively coupled equatorial waves. *J. Climate*, 21, 883-909.

Lin, J. L., **D. Kim**, M.-I. Lee, and I.-S. Kang, 2007: Effects of cloud-radiative heating on AGCM simulations of convectively coupled equatorial waves. *J. Geophys. Res.*, 112, D24107.

Submitted/In Preparation

Daleu, C., S. Woolnough, R. Plant, S. Sessions, M. Herman, A. Sobel, S. Wang, **D. Kim**, A. Cheng, G. Bellon, P. Peyrille, F. Ferry, A. Siebesma, B. van Ulft: Intercomparison of methods of coupling between convection and large-scale circulation. Part II: Comparison over non-uniform surface conditions. *J. Adv. Model. Earth Syst.*, Submitted.

Kim, H.-M., **D. Kim**, F. Vitart, V. E. Toma, J.-S. Kug, and P. J. Webster: MJO propagation across the Maritime Continent in the ECMWF ensemble prediction system, *J. Climate*, Submitted.

Kim, D., J. Ok, B.-M. Kim, and J.-H. Kim: Simulation of early winter atmospheric response to arctic warming: Impacts of low-cloud parameterization. *J. Geophys. Res.*, In preparation.

Other Publications

Invited Talks

- Workshop on Modeling Arctic Climate, KIAPS, Seoul, July 2014.
- IWM-V, Macao, October 2013.
- Workshop on Modeling Monsoon Intraseasonal Variability, Pusan, June 2010.
- International Workshop on Global Climate Monitoring and Modeling, Seoul, June 2009.
- MJO workshop, Irvine, CA, November 2007.

Seminars

- Asia-Pacific Economic Cooperation Climate Center, August 2014.
- Department of Atmospheric Sciences, Yonsei University, July 2014.
- Atmospheric Sciences Program of SEES, Seoul National University, July 2013.
- Atmospheric Environmental Sciences, Pusan National University, June 2013.
- School of Urban and Environmental Engineering, UNIST, June 2013.
- Courant Institute of Mathematical Sciences, New York University, February 2013.
- Goddard Institute for Space Sciences, November 2012.
- SoMAS, Stony Brook University, October 2012.
- Goddard Institute for Space Sciences, October 2012.
- Department of Atmospheric Sciences, University of Washington, August 2012.
- Korea Institute of Atmospheric Prediction Systems, June 2012.
- National Institute of Meteorological Research, KMA, June 2012.
- Max Planck Institute for Meteorology, September 2011.
- Environmental Science and Engineering, Ewha Womans University, March 2011.
- Division of Ocean and Climate Physics, LDEO, February 2011.
- Asia-Pacific Economic Cooperation Climate Center, January 2011.
- Korea Ocean Research and Development Institute, June 2010.
- Center for Climate System Research, University of Tokyo, September 2009.
- Korea Ocean Research and Development Institute, October 2008.

Travel Awards

- 12th International Meeting on Statistical Climatology, Jeju Island, June 2013.
- 1st Pan-GASS Conference, Boulder, CO, September 2012.
- Workshop on the Physics of Weather and Climate Models, Pasadena, CA, March 2012.
- WCRP Open Science Conference, Denver, CO, October 2011.
- 15th Annual CCSM Workshop, Breckenridge, CO, June 2010.

Field Campaign Experience

- Dynamics of the Madden-Julian Oscillation (DYNAMO), Gan Island, Maldives, October 3-20, 2011.

Academic Services

Reviewer for Atmosphere, Climate Dynamics, Climate Research, Journal of Advances in Modeling Earth System, Journal of Atmospheric Sciences, Journal of Climate, Journal of Geophysical Research, Journal of the Meteorological Society of Japan, and the National Science Foundation.