

Myong-In Lee, PhD

RESEARCH AREA

1. Developing Climate-Environment System Models:

- Develop Global Climate Models (GCMs)
- Interested in atmospheric moist physics – Deep convection, Cloud Microphysics, Aerosols, Radiation Interaction
- Evaluate the impact of horizontal/vertical grid spacing
- Evaluate the Data Assimilation Scheme
- Regional and Urban-scale Modeling (WRF/UCM)

2. Sciences on Climate Variability and Change:

- Study the dynamical mechanisms of the global warming process
- Investigate the role of aerosols in precipitation process
- Study periodic weather-climate phenomena (Diurnal Cycle, Tropical Madden-Julian Oscillation, El-Nino, and Decadal Oscillation)

EDUCATION

Ph.D., **Atmospheric Sciences**, 2001 – Seoul National University

Thesis: *Impacts of cumulus parameterization and cloud-radiation interaction processes in GCM simulation of tropical intraseasonal oscillation*

Advisor: Professor In-Sik Kang

M.S., **Atmospheric Sciences**, 1996 – Seoul National University

Thesis: *Temperature variability and its secular warming trend in Korean peninsula*

Advisor: Professor In-Sik Kang

B.S., **Atmospheric Sciences**, 1994 – Seoul National University

EMPLOYMENTS

Ulsan National Institute of Science and Technology

February 2010 – Present

Assistant Professor

NASA Goddard Space Flight Center

March 2003 – January 2010

Research Associate, Assistant Research Scientist

Climate Environment System Research Center, Seoul National University

March 2001 – March 2003

Post-doctoral Research Scientist

RESEARCH PROJECTS

- Development of GAIA Simulator- Carbon Cycle, NRF, 2012-2016
- Development of the global ensemble seasonal prediction system, CATER, 2013-2016
- Evaluation of the GloSea4 Experimental Hindcasts, KMA, 2012-2013
- Development of Urban Climate and Environmental Prediction System Using WRF/UCM, NRF, 2011-2014
- Development of Tropical Cyclone Prediction System, APEC Climate Center, 2011-2013.
- Improvement of Diurnal Cycle of Warm-Season Precipitation in Global Climate Models, KMA, 2010-2012

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- Development of a High-Resolution Global Climate Model for the Tropical Typhoon Simulation, KMA, 2010-2011.
- Use of cloud-resolving models to improve the simulation of convective precipitation and diurnal cycle in the NASA GEOS-5, Lee, M.-I., Principal Investigator with 5 other Co-Is, 2009 – 2012.
- Simulating and predicting sub-seasonal and longer-term changes in tropical storm characteristics using high-resolution climate models, PI: Schubert (NASA/GSFC), Co-I, 2009 – 2010.
- Improved representation of diurnal precipitation patterns in the NASA GEOS5 general circulation models, PI: Posselt (U. Michigan), Co-I, 2009 – 2010.
- Pathways to predictability on subseasonal time scales: assessing the role of tropical forcing and land surface conditions, PI: Schubert (NASA/GSFC), Co-I, 2005 – 2010.
- An assessment and analysis of the warm season diurnal cycle over the continental United States and northern Mexico in global atmospheric general circulation model, PI: Schubert (NASA/GSFC), Co-I, NOAA/OGP, 2003-2005
- Development of the Climate System Models (전지구 기후시스템 모델 개발), PI: In-Sik Kang (SNU), Co-I, Korea Ministry of Science and Technology (SRC Project), 2001-2003
- Development of Long-range Prediction System (기상청 전지구 장기예측모델 개발), PI: In-Sik Kang (SNU), Co-I, Korean Meteorological Administration, 1999-2003
- Monitoring and Prediction of Global Warming (지구온난화 감시 및 예측기법 개발), Principal Investigator (PI): In-Sik Kang (SNU), involved as Co-Investigator (Co-I), Korea Ministry of Science and Technology (G7 Project), 1994-1998

TEACHING EXPERIENCES

- *Climate Dynamics* (graduate), SNU, 2002
- An Introduction to the *Climate System Modeling* (graduate), SNU, 2002
- *Introduction to the Environmental Engineering* (undergraduate, co-teaching), UNIST, 2010-
- *Introduction to Climate Change* (undergraduate), UNIST, 2010
- *Global Environment* (undergraduate), UNIST, 2010-
- *Climate and Environmental Modeling* (graduate), UNIST, 2010-
- *Atmospheric Dynamics* (undergraduate), UNIST, 2011-

PROFESSIONAL SERVICES

- Advisory Board, Korean Meteorological Administration, 2012-2014
- Executive Member, Korean Meteorological Society, 2012-2013
- Member, Working Group for the APEC Climate Center (APCC), 2007-2010
- Member, US/CLIVAR AGCM intercomparison for the MJO simulation, since 2007-2010
- Member, North American Monsoon Experiment (NAME) Forecast Forum, 2007-2010
- Member, North American Monsoon Model Assessment Project 2 (NAMAP2), 2006-2010
- Editor, Korean Atmospheric Scientists in America (KASA), publish on-line newsletter, 2006
- Member, North American Monsoon Experiment (NAME), 2003-2006
- Member, Aqua-Planet Experiment (APE) for General Circulation Models, since 2003

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- Member, Korean Meteorological Society, since 2001
- Member, American Meteorological Society, since 2008
- Member, American Geophysical Union, since 2008
- Journal Peer Reviewer: Tellus A, Atmos. Environ., J. Climate, J. Atmos. Sci., J. Geophys. Res, Geophys. Res. Lett., Climate Dynamics, Dynamics of Atmospheres and Oceans, Advances in Atmospheric Sciences, Scientific Online Letters on the Atmosphere, Asia-Pacific Journal of Atmospheric Sciences, since 2003
- Proposal/Award Reviewer: NASA Earth System Science (ESS) Fellowship (2006-2008), NOAA Oceanic and Atmospheric Research (OAR) Outstanding Paper Award (2008)

HONORS/AWARDS

- President Award for Best Teaching, UNIST, 2010
- Outstanding Performance Award, NASA/Goddard Space Flight Center/Global Modeling and Assimilation Office, 2004
- Best PhD Dissertation Award, Korean Meteorological Society, 2001

INVITED SEMINAR/PRESENTATIONS

- The Climate Prediction Program for the Americas (CPPA) 2008
- APEC Climate Symposium, Lima, Peru 2008
- APEC Climate Symposium, Busan, Korea 2007
- Climate Diagnostics & Prediction Workshop, Boulder, USA 2006
- A Workshop on the Seasonal-to-Interannual Prediction, Taipei, Taiwan 2003

PUBLICATIONS

- **International Journals (SCI)** (after joining UNIST #1-16)
H index = 13, Total Citation = 646 (November 5, 2013)

Summary

	<i># of SCI(E) papers</i>	<i>1st/Corr.</i>	<i># of TOP 10%</i>	<i>1st/Corr. (TOP 10%)</i>
<i>Total</i>	<i>30</i>	<i>11</i>	<i>14</i>	<i>4</i>
<i>Before UNIST</i>	<i>19</i>	<i>7</i>	<i>9</i>	<i>2</i>
<i>After UNIST (4 years)</i>	<i>11</i>	<i>4</i>	<i>5</i>	<i>2</i>

- *4 out of 11 papers were co-authored by graduate students of UNIST*

1. Kang, D. **M.-I. Lee***, H. -M. Kim, D. Kim, H.-S. Kang and S. D. Schubert, 2013: Prediction of the Arctic Oscillation in Boreal Winter by Dynamical Seasonal Forecasting Systems, **In preparation**
2. Kang, D. J. Im*, **M.-I. Lee**, and L. J. Quackenbush, 2013: The MODIS Ice Surface Temperature Product as an Indicator of Interannual Variation of Sea Ice Minimum over the Arctic Ocean., **In preparation for resubmission**
3. Jeong, S.-J.*, C.-H. Ho, C.-S. Jin, **M.-I. Lee**, Y.-S. Choi, and Y. Ryu, 2013: Comprehensive assessment of urban albedo management for cooling a megacity: A case study of Seoul, South Korea. **In preparation for resubmission**

4. Lee, M.-I., H.-S. Kang, D. Kim, D. Kim, H. Kim, and D. Kang, 2013: Validation of the Experimental Hindcasts Produced by the GloSea4 Seasonal Prediction System. *Asia-Paific J. Atmos. Sci.*, **Accepted**, IF=0.869, Ranking=83%
5. Kim, D., **M.-I. Lee***, H.-M. Kim, and S. D. Schubert, 2013: The Modulation of Tropical Storm Activity in the Western North Pacific by the Madden-Julian Oscillation in the GEOS-5 AGCM Experiments. *Atmos. Sci. Lett.*, **Submitted**, IF=1.750, Ranking=48%
6. Shin, S.H., and **M.-I. Lee***, 2013: Examinations of low cloud variability and cloud-radiative feedback in general circulation models. *Asia-Paific J. Atmos. Sci.*, **Submitted**, IF=0.869, Ranking=83%
7. Kim, H.-M*, **M.-I. Lee**, P.J. Webster, D. Kim, and J.-H. Yoo, 2013: A physical Basis for the Probabilistic Prediction of the Accumulated Tropical Cyclone Kinetic Energy in the Western North Pacific. *J. Clim.*, **26**, 7981-7991, doi: <http://dx.doi.org/10.1175/JCLI-D-12-00679.1>, IF=4.362, Citation number=0, Ranking=6%
8. Kim, D., **M.-I. Lee***, D. Kim, S. D. Schubert, D.E. Waliser, B. Tian, Representation of tropical subseasonal variability of precipitation in global reanalysis products. *Clim. Dyn.*, doi: 10.1007/s00382-013-1890-x, IF=4.231, Citation number=0, Ranking=8%
9. Blackburn, M.*, D. L. Williamson, K. Nakajima, W. Ohfuchi, Y. O. Takahashi, Y.-Y. Hayashi, H. Nakamura, M. Ishiwatari, J. McGregor, H. Borth, V. Wirth, H. Frank, P. Bechtold, N. P. Wedi, H. Tomita, M. Satoh, M. Zhao, I. M. Held, M. J. Suarez, **M.-I. Lee**, M. Watanabe, M. Kimoto, Y. Liu, Z. Wang, A. Molod, K. Rajendran, A. Kitoh, and R. Stratton, 2013: The Aqua Planet Experiment(APE): Control SST simulation. *J. Meteor. Soc. Japan*, **91A**, 17-56, doi:10.2151/jmsj.2013-A02., IF=0.800, Citation number=0, Ranking=86%
10. Williamson, D. L.*, M. Blackburn, K. Nakajima, W. Ohfuchi, Y. O. Takahashi, Y.-Y. Hayashi, H. Nakamura, M. Ishiwatari, J. McGregor, H. Borth, V. Wirth, H. Frank, P. Bechtold, N. P. Wedi, H. Tomita, M. Satoh, M. Zhao, I. M. Held, M. J. Suarez, **M.-I. Lee**, M. Watanabe, M. Kimoto, Y. Liu, Z. Wang, A. Molod, K. Rajendran, A. Kitoh, and R. Stratton, 2013: The Aqua Planet Experiment(APE): Response to changed meridional SST fields. *J. Meteor. Soc. Japan*, **91A**, 57-89 doi:10.2151/jmsj.2013-A03., IF=0.800, Citation number=0, Ranking=86%
11. Yamada, T. J.*, **M.-I. Lee**, M. Kanamitsu, H. Kanamaru, 2012: Diurnal Characteristics of Rainfall over the Contiguous United States and Northern Mexico in the Dynamically Downscaled Reanalysis Dataset (US10). *J. Hydrometeor*, **13**, 1142–1148. doi: <http://dx.doi.org/10.1175/JHM-D-11-0121.1>, IF=3.273, Citation number=1, Ranking=18%
12. **Lee, M. -I***, S. D. Schubert. and D. Kim, 2011: Representation of Tropical Storms in the Northwestern Pacific by the Modern-Era Retrospective Analysis for Research and Applications. *Asia-Paific J. Atmos. Sci.*, **47**, 245-253., IF=0.869, Citation number=1, Ranking=83%
13. Jiang, X.*, D.E. Waliser, D. Kim, M. Zhao, K.R. Sperber, W. F. Stern, S.D. Schubert, G.J. Zhang, W. Wang, M. Khairoutdinov, R. B. Neale, and **M.-I. Lee**, 2011: Simulation of the intraseasonal variability over the Eastern Pacific ITCZ in climate models. *Clim. Dyn.*, **39**, 617-636, DOI 10.1007/s00382-011-1098-x, IF=4.231, Citation number=3, Ranking=8%
14. Frierson, D. M. W., D. Kim*, I.-S. Kang, **M.-I. Lee**, J. Lin, 2011: Structure of AGCM-Simulated Convectively Coupled Kelvin Waves and Sensitivity to Convective Parameterization. *J. Atmos. Sci.*, **68**, 26–45. doi: <http://dx.doi.org/10.1175/2010JAS3356.1>, IF=2.672, Citation number=13, Ranking=32%

15. Matsui, T.*, D. Mocko, **M.-I. Lee**, W.-K. Tao, M. J. Suarez, and R. A. Pielke Sr., 2010: Ten-year climatology of summertime diurnal rainfall rate over the conterminous U.S. *Geophys. Res. Lett.*, **37**, L13807, doi:10.1029/2010GL044139., **IF=3.982, Citation number=5, Ranking=6%**
16. **Lee, M.-I.***, I. Choi, W.-K. Tao, S. D. Schubert, I.-S. Kang, 2010: Mechanisms of diurnal precipitation over the United States Great Plains: A cloud resolving model perspective. *Clim. Dyn.*, **34**, 419-437, doi 10.1007/s00382-009-0531-x., **IF=4.231, Citation number=3, Ranking=8%**
17. 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., **IF=4.362, Citation number=65, Ranking=6%**
18. Bell, T. L.*, J.-M. Yoo, and M.-I. Lee, 2009: Note on the weekly cycle of storm heights over the SE U.S., *J. Geophys. Res.*, **114**, D15201, doi:10.1029/2009JD012041., **IF=3.174, Citation number=8, Ranking=13%**
19. Gutzler, D.*, L. N. Long, J. Schemm, M. Bosilovich, J. Chern, J. C. Collier, M. Kanamitsu, P. Kelly, D. Lawrence, **M.-I. Lee**, R. Lobato S., B. Mapes, K. Mo, A. Nunes, E. Ritchie, J. Roads, S. B. Roy, S. Schubert, H. Wei and G. Zhang, 2009: NAMAP2: Atmospheric simulations of the 2004 North American Monsoon circulation. *J. Climate*, **22**, 6716-6740., **IF=4.362, Citation number=7, Ranking=6%**
20. **Lee, M.-I.***, M. J. Suarez, I.-S. Kang, I. M. Held, and D. Kim, 2008: A moist benchmark calculations for atmospheric general circulation models. *J. Climate*, **21**, 4934-4954., **IF=4.362, Citation number=7, Ranking=6%**
21. **Lee, M.-I.***, S. D. Schubert, M. J. Suarez, J.-K. E. Schemm, H.-L. Pan, J. Han, and S.-H. Yoo, 2008: Role of convection triggers in the simulation of the diurnal cycle of precipitation over the United States Great Plans in a general circulation model. *J. Geophys. Res.*, **113**, D02111, doi:10.1029/2007JD008984. , **IF=3.174, Citation number=15, Ranking=13%**
22. Lin, J.-L.*, **M.-I. Lee**, D. Kim, I.-S. Kang, and D. M. W. Frierson, 2008: Impacts of convective parameterization and moisture convective trigger on AGCM-simulated convectively coupled equatorial waves. *J. Climate*, **21**, 883-909., **IF=4.362, Citation number=45, Ranking=6%**
23. Bell, T. L.*, D. Rosenfeld, K.-M. Kim, J.-M. Yoo, **M.-I. Lee**, and M. Hahnenberger, 2008: Midweek increase in U.S. summer rain suggests air pollution invigorates rainstorms. *J. Geophys. Res.*, **113**, D02209, doi:10.1029/2007JD008623., **IF=3.174, Citation number=70, Ranking=13%**
24. Jiang, X.*, D. E. Waliser, M. C. Wheeler, C. Jones, **M.-I. Lee**, and S. D. Schubert, 2008: Assessing the Skill of an All-season Statistical Forecast Model for the Madden-Julian Oscillation. *Mon. Weather Rev.*, **136**, 1940-1956., **IF=2.758, Citation number=26, Ranking=27%**
25. Lin, J.-L.*, B. E. Mapes, K. M. Weickmann, G. N. Kiladis, S. D., Schubert, M. J. Suarez, J. T. Bacmeister, and **M.-I. Lee**, 2008: North American monsoon and convectively coupled equatorial waves simulated by IPCC AR4 coupled GCMs. *J. Climate*, **21**, 2919-2937., **IF=4.362, Citation number=15, Ranking=6%**
26. Lin, J.-L.*, K. M. Weickmann, G. N. Kiladis, B. E. Mapes, S. D., Schubert, M. J. Suarez, J. T. Bacmeister, and **M.-I. Lee**, 2008: Subseasonal variability associated with Asian summer monsoon simulated by 14 IPCC AR4 coupled GCMs. *J. Climate*, **21**, 4541-4567., **IF=4.362,**

Citation number=33, Ranking=6%

27. Lee, M.-I.*, S.D. Schubert, M. J. Suarez, I. M. Held, A. Kumar, T. L. Bell, J.-K. E. Schemm, N.-C. Lau, J.-J. Ploshay, H.-K. Kim, J. J. Ploshay, S.-H. Yoo, 2007: Sensitivity to horizontal resolution in the AGCM simulations of warm season diurnal cycle of precipitation over the United States and northern Mexico. *J. Clim.*, **20**, 1862–1881., IF=4.362, Citation number=26, Ranking=6%
28. Lee, M.-I.*, S.D. Schubert, M. J. Suarez, I. M. Held, N.-C. Lau, J. J. Ploshay, A. Kumar, H.-K. Kim, and J.-K. E. Schemm, 2007: An analysis of the warm season diurnal cycle over the continental United States and northern Mexico in general circulation models. *J. Hydromet.*, **8**, 344-366., IF=3.273, Citation number=29, Ranking=18%
29. Lee, M.-I.*, S.D. Schubert, M. J. Suarez, T. L. Bell, and K.-M. Kim, 2007: Diurnal cycle of precipitation in the NASA Seasonal to Interannual Prediction Project atmospheric general circulation model. *J. Geophys. Res.*, **112**, D16111, doi:10.1029/2006JD008346., IF=3.174, Citation number=8, Ranking=13%
30. Lau, W. K. M.*, K.-M. Kim, and M.-I. Lee, 2007: Characteristics of diurnal and seasonal cycles in global monsoon systems. *J. Meteorol. Soc. Japan*, **85A**, 403-416., IF=0.800, Citation number=5, Ranking=86%
31. Lin, J.-L., D. Kim, M.-I. Lee, and I.-S. Kang, 2007: Effects of cloud-radiative heating on atmospheric general circulation model (AGCM) simulations of convectively coupled equatorial waves, *J. Geophys. Res.*, **112**, D24107, doi:10.1029/2006JD008291., IF=3.174, Citation number=3, Ranking=13%
32. Higgins, W., D. Ahijevych, J. Amador, A. Barros, E. H. Berbery, E. Caetano, P. Ciesielski, R. Cifelli, M. Cortez-Vazquez, A. Douglas, M. Douglas, G. Emmanuel, C. Fairall, D. Gochis, D. Gutzler, R. Johnson, C. King, T. Lang, M.-I. Lee, D. Lettenmaier, R. Lobato, V. Magaña, J. Meitin, K. Mo, S. Nesbitt, E. Pytlak, P. Rogers, S. Rutledge, J. Schemm, S. Schubert, F. Torres, A. White, C. Williams, A. Wood, R. Zamora, C. Zhang, 2006: The NAME 2004 Field Campaign and Modeling Strategy. *Bull. Amer. Meteorol. Soc.*, **87**, 79–94., IF=6.591, Citation number=68, Ranking=2%
33. Waliser, D. E.*, K. Jin, I.-S. Kang, W. F. Stern, S. D. Schubert, K.-M. Lau, M.-I. Lee, V. Krishnamurthy, A. Kitoh, G. A. Meehl, V. Y. Galin, V. Satyan, S. K. Mandke, G. Wu, Y. Liu, and C.-K. Park, 2003: AGCM Simulations of Intraseasonal Variability Associated with the Asian Summer Monsoon, *Clim. Dyn.*, **21**, 423-446., IF=4.231, Citation number=101, Ranking=8%
34. Lee, M.-I., I.-S. Kang*, and B. E. Mapes, 2003: Impacts of cumulus convection parameterization on the aqua-planet AGCM simulations of tropical intraseasonal oscillation, *J. Meteorol. Soc. Japan*, **81**, No.5, 963-992., IF=0.800, Citation number=46, Ranking=86%
35. Lee, M.-I., I.-S. Kang*, J.-K. Kim, and B. E. Mapes, 2001: Influences of cloud-radiation interaction on simulating tropical intraseasonal oscillation with an atmospheric general circulation model. *J. Geophys. Res.*, **106**, D13, 14,219-14,233., IF=3.174, Citation number=43, Ranking=13%

• **Non-SCI Publications**

1. Gutzler, D., L. N. Long, J. Schemm, M. Bosilovich, J. Chern, J. C. Collier, M. Kanamitsu, P. Kelly, D. Lawrence, M.-I. Lee, R. Lobato S., B. Mapes, K. Mo, A. Nunes, E. Ritchie, J. Roads, S. B. Roy, S. Schubert, H. Wei and G. Zhang, 2008: Atmospheric simulations of the

- 2004 North American Monsoon circulation: NAMAP2, CLIVAR Exchanges Newsletter, No. 45, 31pp.
2. Williamson, D.L., M. Blackburn, B. J. Hoskins, K. Nakajima, W. Ohfuchi, Y. O. Takahashi, Y.-Y. Hayashi, H. Nakamura, M. Ishiwatari, J. L. McGregor, H. Borth, V. Wirth, H. Frank, P. Bechtold, N. P. Wedi, H. Tomita, M. Satoh, M. Zhao, I. M. Held, M. J. Suarez, M.-I. Lee, M. Watanabe, M. Kimoto, Y. Liu, Z. Wang, A. Molod, K. Rajendran, A. Kitoh and R. Stratton, 2012: THE APE ATLAS, NCAR Technical Note NCAR/TN-484+STR, National Center for Atmospheric Research, Boulder, Colorado, xxii+508 pp, <http://dx.doi.org/10.5065/D6FF3QBR>. Available online at <http://nldr.library.ucar.edu/repository/collections/TECH-NOTE-000-000-000-865>.
- **Domestic (Korean) Journals**
 1. **Lee, M.-I.**, and I.-S. Kang, 1997: Temperature variability and warming trend associated with global warming in Korean peninsula, *Asia-Pacific J. Atmos. Sci.*, **33(3)**, 429-443
 2. **Lee, M.-I.**, 2001: Influence of cloud-radiation interaction in AGCM simulations of tropical intraseasonal oscillation. *Atmosphere*, 11(4), 13-16

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