

Jong-Jin Baik

Professor

School of Earth and Environmental Sciences

Seoul National University

Seoul 08826, South Korea

Email: jjbaik@snu.ac.kr

Phone: +82-2-880-6990, Fax: +82-2-883-4972

Education

Ph.D. in Atmospheric Science, 1989, Department of Marine, Earth and Atmospheric Sciences,
North Carolina State University, U.S.A. (minor: Mathematics)

Thesis title: Tropical cyclone simulations with the Betts convective adjustment scheme
(advisors: Mark DeMaria and Sethu Raman)

M.S. in Meteorology, 1986, Department of Meteorology, Seoul National University, Korea

Thesis title: Evaporation associated with polar air outbreaks over the Yellow Sea
(advisor: Sung Sam Kim)

B.S. in Earth Science Education, 1984, Department of Earth Science Education, Seoul National
University, Korea

Professional Careers

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| 2007 – | Professor, School of Earth and Environmental Sciences, Seoul National
University, Korea
Also affiliated with Interdisciplinary Program of Computational Science and
Technology, Seoul National University, Korea since 2017 |
| 2011 | Visiting Professor, Graduate School of Wind Energy, Pohang University of
Science and Technology (POSTECH), Korea |
| 2003 – 2007 | Associate Professor, School of Earth and Environmental Sciences, Seoul
National University, Korea |
| 2001 – 2003 | BK21 Research Associate Professor, School of Earth and Environmental
Sciences, Seoul National University, Korea |
| 1995 – 2001 | Associate Professor, Department of Environmental Science and Engineering,
Gwangju Institute of Science and Technology, Korea |
| 2000 | Senior Visitor, Department of Applied Mathematics and Theoretical Physics,
University of Cambridge, U.K. |
| 1994 – 1995 | Visiting Associate Professor, Center for Climate System Research, University
of Tokyo, Japan |
| 1993 – 1994 | Senior Scientist, Global Environment Laboratory, Yonsei University, Korea |
| 1991 – 1993 | USRA Research Scientist, Severe Storms Branch, NASA/Goddard Space
Flight Center, U.S.A. |
| 1990 – 1991 | Postdoctoral Fellow, Department of Marine, Earth and Atmospheric Sciences,
North Carolina State University, U.S.A. |

1990 Visiting Scientist, Hurricane Research Division, Atlantic Oceanographic and Meteorological Laboratory/NOAA, U.S.A.

Teaching Courses

Atmospheric thermodynamics (undergraduate course)
Atmospheric prediction and lab. (undergraduate course)
Atmospheric physics 2 (undergraduate course)
Mesoscale meteorology (graduate course)
Cloud physics (graduate course)

Current Students and Researchers/Postdoctoral Fellows

advising 1 M.S. student, 4 Ph.D. students, and 2 postdoc.

Ph.D. Graduates Supervised

Jae-Jin Kim, 2001, Gwangju Institute of Science and Technology
Thesis title: Flow and pollutant dispersion in urban street canyons
Affiliation: Professor, Department of Environmental Atmospheric Sciences, Pukyong National University, Korea

Yeon-Hee Kim, 2003, Gwangju Institute of Science and Technology
(supervised jointly with Prof. Jai-Hoon Lee)
Thesis title: Meteorological aspects of urban heat islands
Affiliation: Senior research scientist, Applied Meteorology Research Division, National Institute of Meteorological Sciences, Korea

Sang-Hyun Lee, 2008, Seoul National University
Thesis title: Development of a vegetated urban canopy model and its application to urban heat island simulations
Affiliation: Professor, Department of Atmospheric Science, Kongju National University, Korea

Ji-Young Han, 2010, Seoul National University
Thesis title: Convectively forced mesoscale flows and aerosol-cloud interactions
Affiliation: Senior research scientist, Korea Institute of Atmospheric Prediction Systems, Korea

Young-Hee Ryu, 2012, Seoul National University
Thesis title: Urban impacts on local circulation and air quality
Affiliation: Research associate professor, Division of Environmental Science and Engineering, Pohang University of Science and Technology, Korea

Seung-Bu Park, 2013, Seoul National University
Thesis title: Turbulence coherent structures and scalar dispersion over heated urban surfaces
Affiliation: Senior researcher, Atmospheric Environmental Research Institute, Seoul National University, Korea

Kyung-Hwan Kwak, 2014, Seoul National University

Thesis title: Microscale flow, gas-phase chemistry, and dispersion in urban areas
 Affiliation: Associate professor, School of Natural Resources and Environmental Science, Kangwon National University, Korea
 Gantuya Ganbat, 2015, Seoul National University

Thesis title: Local circulations in mountainous urban areas
 Affiliation: Assistant professor, Faculty of Engineering (Environmental Engineering), German-Mongolia Institute for Resources and Technology, Mongolia
 Hyunho Lee, 2016, Seoul National University

Thesis title: Effects of in-cloud turbulence on clouds and precipitation
 Affiliation: Assistant professor, Department of Atmospheric Science, Kongju National University, Korea
 Jaemyeong Mango Seo, 2018, Seoul National University

Thesis title: Dynamics and modeling of thermally and orographically forced flows and convection
 Affiliation: Postdoctoral fellow, Precipitating Convection Group, Max Planck Institute for Meteorology, Germany
 Jambajamts Lkhamjav, 2018, Seoul National University

Thesis title: A quasi-stochastic collection model and cloud and precipitation modeling
 Affiliation: Assistant professor, Department of Applied Mathematics, National University of Mongolia, Mongolia
 Beom-Soon Han, 2019, Seoul National University

Thesis title: Large-eddy simulations of urban turbulence, boundary layer, and air quality
 Affiliation: Assistant professor, Department of Biochemical and Environmental Engineering, Semyung University, Korea
 Han-Gyul Jin, 2021, Seoul National University

Thesis title: Development of new accretion parameterizations and their applications to cloud and precipitation modeling
 Affiliation: Postdoctoral fellow, Research Institute of Basic Sciences, Seoul National University, Korea
 Sungju Moon, 2021, Seoul National University

Thesis title: High-dimensional Lorenz systems, atmospheric predictability, and data Assimilation
 Affiliation: Postdoctoral fellow, Research Institute of Basic Sciences, Seoul National University, Korea
 Tanvir Ahmed, 2021, Seoul National University

Thesis title: Observed characteristics and modeling of monsoonal precipitation in Bangladesh and northeast India
 Affiliation: Associate professor, Department of Physics, Shahjalal University of Science and Technology, Bangladesh

Research Interest

Cloud microphysics
 Numerical precipitation prediction

Thermally forced mesoscale flows
Urban heat islands
Urban flow, convection, and dispersion
Urban impacts on weather and air quality
Nonlinear dynamics and chaos of thermal convection

Honors and Awards

Teaching Award, College of Natural Sciences, Seoul National University, 2008, 2016
Max Eaton Prize, American Meteorological Society, 1989
Top honor graduate, Department of Earth Science Education, Seoul National University, 1984

Professional Activities and Services (some listed)

Director of Atmospheric Environment Research Institute, Seoul National University, 2014-2016
Chair of Atmospheric Sciences Program, School of Earth and Environmental Sciences, Seoul National University, 2009-2011
Associate Director of School of Earth and Environmental Sciences BK21 Program, Seoul National University, 2009-2011
Organizer of Workshop on Local Meteorology, Korea, 2008, 2010
Co-organizer of The University Allied Workshop on Climate and Environmental Changes, Korea, 2009
Co-convenor of International Workshop on Climate Environment System, Korea, 2008
Executive Director of Climate Environment System Research Center (CES), Seoul National University, 2003-2009
Co-convenor of Typhoons and Mesoscale Weather Session, Asia Oceania Geosciences Society, Singapore, 2004, 2005
Co-organizer of The University Allied Workshop on Climate and Environmental Modeling, Korea, 2005
Reviewer of papers submitted to: Journal of Applied Meteorology and Climatology, Journal of the Atmospheric Sciences, Atmospheric Environment, Environmental Fluid Mechanics, Physics of Fluids, Theoretical and Applied Climatology, Journal of Wind Engineering and Industrial Aerodynamics, Theoretical and Computational Fluid Mechanics, Computer Methods in Applied Mechanics and Engineering, Wind and Structures, Journal of the Air and Waste Management Association, Journal of Geophysical Research, Bulletin of the American Meteorological Society, Air Quality, Atmosphere and Health, Journal of Environmental Quality, International Journal of Heat and Fluid Flow, Computers and Fluids, Quarterly Journal of the Royal Meteorological Society, Environment and Planning B, Building Simulation: An International Journal, Journal of Oceanography, Asia-Pacific Journal of Atmospheric Sciences, Advances in Atmospheric Sciences, International Journal of Environmental Technology and Management, Environmental Science and Pollution Research, Atmospheric Chemistry and Physics, Monthly Weather Review, Meteorology and Atmospheric Physics, Boundary-Layer Meteorology, CLEAN - Soil, Air, Water, International Journal of Geosciences, Urban Forestry & Urban Greening, Urban

Climate, Remote Sensing, Atmospheric Pollution Research, Environmental Pollution, Advances in Meteorology, Aerosol and Air Quality Research, Scientific Reports, Meteorological Applications, Air Quality, Atmosphere and Health, Journal of Climate Editorial Board: Asia-Pacific Journal of Atmospheric Sciences, editor, 2011-2015
Atmosphere, Korean Meteorological Society, chief editor, 2009

Publications

167. Moon, S., and J.-J. Baik, 2021: Using the (3N)-dimensional generalized Lorenz systems as a testbed for data assimilation: The ensemble Kalman filter. *Monthly Weather Review*, 149, 3691-3705.

166. Ahmed, T., S.-H. Hong, H.-G. Jin, J. Lee, and J.-J. Baik, 2021: Evaluation of IMERG data in Bangladesh and surrounding regions and their application to studying diurnal variation of precipitation. *Theoretical and Applied Climatology*, 146, 395-410.

165. Kwak, K.-H., B.-S. Han, K. Park, S. Moon, H.-G. Jin, and J.-J. Baik, 2021: Inter- and intra-city comparisons of PM_{2.5} concentration changes under COVID-19 social distancing in seven major cities of South Korea. *Air Quality, Atmosphere & Health*, 14, 1155-1168.

164. Park, J., S. Moon, J. M. Seo, and J.-J. Baik, 2021: Systematic comparison between the generalized Lorenz equations and DNS in the two-dimensional Rayleigh–Bénard convection. *Chaos*, 31, 073119.

163. Jwa, M., H.-G. Jin, J. Lee, S. Moon, and J.-J. Baik, 2021: Characteristics of raindrop size distribution in Seoul, South Korea according to rain and weather types. *Asia-Pacific Journal of Atmospheric Sciences*, 57, 605-617.

162. Moon, S., J.-J. Baik, and S.-H. Hong, 2021: Coexisting attractors in a physically extended Lorenz system. *International Journal of Bifurcation and Chaos*, 31, 2130016.

161. Shen B.-W., R. A. Pielke Sr., X. Zeng, J.-J. Baik, S. Faghieh-Naini, J. Cui, and R. Atlas, 2021: Is weather chaotic?: Coexistence of chaos and order within a generalized Lorenz model. *Bulletin of the American Meteorological Society*, 102, E148-E158.

160. Moon, S., J.-J. Baik, and J. M. Seo, 2021: Chaos synchronization in generalized Lorenz systems and an application to image encryption. *Communications in Nonlinear Science and Numerical Simulation*, 96, 105708.

159. Moon, S., J.-J. Baik, J. M. Seo, and B.-S. Han, 2021: Effects of density-affecting scalar on the onset of chaos in a simplified model of thermal convection: A nonlinear dynamical perspective. *The European Physical Journal Plus*, 136, 92.

158. Ahmed, T., H.-G. Jin, and J.-J. Baik, 2020: A physically based raindrop–cloud droplet accretion parametrization for use in bulk microphysics schemes. *Quarterly Journal of the Royal Meteorological Society*, 146, 3368–3383.
157. Han, B.-S., K. Park, K.-H. Kwak, S.-B. Park, H.-G. Jin, S. Moon, J.-W. Kim, and J.-J. Baik, 2020: Air quality change in Seoul, South Korea under COVID-19 social distancing: Focusing on PM_{2.5}. *International Journal of Environmental Research and Public Health*, 17, 6208.
156. Jin, H.-G., and J.-J. Baik, 2020: A new parameterization of the accretion of cloud water by snow and its evaluation through simulations of mesoscale convective systems. *Journal of the Atmospheric Sciences*, 77, 2885–2903.
155. Ahmed, T., H.-G. Jin, and J.-J. Baik, 2020: Spatiotemporal variations of precipitation in Bangladesh revealed by nationwide rain gauge data. *Asia-Pacific Journal of Atmospheric Sciences*, 56, 593–602.
154. Moon, S., J. M. Seo, and J.-J. Baik, 2020: High-dimensional generalizations of the Lorenz system and implications for predictability. *Physica Scripta*, 95, 085209.
153. Park, S.-B., J.-J. Baik, and B.-S. Han, 2020: Role of wind shear in the decay of convective boundary layers. *Atmosphere*, MDPI, 11, 622.
152. Park, S.-B., and J.-J. Baik, 2020: Characteristics of decaying convective boundary layers revealed by large-eddy simulations. *Atmosphere*, MDPI, 11, 434.
151. Lee, J., J. M. Seo, J.-J. Baik, S.-B. Park, and B.-S. Han, 2020: A numerical study of windstorms in the lee of the Taebaek Mountains, South Korea: Characteristics and generation mechanisms. *Atmosphere*, MDPI, 11, 431.
150. Han, B.-S., J.-J. Baik, K.-H. Kwak, and S.-B. Park, 2020: Effects of cool roofs on turbulent coherent structures and ozone air quality in Seoul. *Atmospheric Environment*, 229, 117476.
149. Seo, J. M., H. Lee, S. Moon, and J.-J. Baik, 2020: How mountain geometry affects aerosol-cloud-precipitation interactions: Part I. Shallow convective clouds. *Journal of the Meteorological Society of Japan*, 98, 43–60.
148. Kim, J.-W., B.-S. Han, and J.-J. Baik, 2020: Temporal and spatial variations of workday-holiday particulate matter concentration differences in Seoul. *Journal of Korean Society for Atmospheric Environment*, 36, 25–31.
147. Lee, H., and J.-J. Baik, 2019: Corrigendum to “A physically based autoconversion parameterization”. *Journal of the Atmospheric Sciences*, 76, 3285.

146. Han, B.-S., J.-J. Baik, and K.-H. Kwak, 2019: A preliminary study of turbulent coherent structures and ozone air quality in Seoul using the WRF-CMAQ model at a 50 m grid spacing. *Atmospheric Environment*, 218, 117012.
145. Moon, S., J. M. Seo, B.-S. Han, J. Park, and J.-J. Baik, 2019: A physically extended Lorenz system. *Chaos*, 29, 063129.
144. Han, B.-S., J.-J. Baik, S.-B. Park, and K.-H. Kwak, 2019: Large-eddy simulations of reactive pollutant dispersion in the convective boundary layer over flat and urban-like surfaces. *Boundary-Layer Meteorology*, 172, 271-289.
143. Jin, H.-G., H. Lee, and J.-J. Baik, 2019: A new parameterization of the accretion of cloud water by graupel and its evaluation through cloud and precipitation simulations. *Journal of the Atmospheric Sciences*, 76, 381-400.
142. Seo, J. M., J.-J. Baik, and H.-Y. Chun, 2018: Theoretical investigation of nonhydrostatic effects on convectively forced flows: Propagating and evanescent gravity-wave modes. *Physics of Fluids*, 30, 126604.
141. Lee, H., and J.-J. Baik, 2018: A comparative study of bin and bulk cloud microphysics schemes in simulating a heavy precipitation case. *Atmosphere*, MDPI, 9, 475.
140. Lkhamjav, J., H. Lee, Y.-L. Jeon, J. M. Seo, and J.-J. Baik, 2018: Impacts of aerosol loading on surface precipitation from deep convective systems over north central Mongolia. *Asia-Pacific Journal of Atmospheric Sciences*, 54, 587-598.
139. Jeon, Y.-L., S. Moon, H. Lee, J.-J. Baik, and J. Lkhamjav, 2018: Non-monotonic dependencies of cloud microphysics and precipitation on aerosol loading in deep convective clouds: A case study using the WRF model with bin microphysics. *Atmosphere*, MDPI, 9, 434.
138. Lee, H., J.-J. Baik, and A. P. Khain, 2018: Turbulence effects on precipitation and cloud radiative properties in shallow cumulus: An investigation using the WRF-LES model coupled with bin microphysics. *Asia-Pacific Journal of Atmospheric Sciences*, 54, 457-471.
137. Seo, J. M., J.-J. Baik, and S. Moon, 2018: Orographic-convective flows, wave reflection, and gravity-wave momentum fluxes in a two-layer hydrostatic atmosphere. *Tellus A: Dynamic Meteorology and Oceanography*, 70, 1-16.
136. Han, B.-S., J.-J. Baik, K.-H. Kwak, and S.-B. Park, 2018: Large-eddy simulation of reactive pollutant exchange at the top of a street canyon. *Atmospheric Environment*, 187, 381-389.
135. Kwak, K.-H., S. H. Woo, K. H. Kim, S.-B. Lee, G.-N. Bae, Y.-I. Ma, Y. Sunwoo, and J.-J. Baik, 2018: On-road air quality associated with traffic composition and street-canyon ventilation: Mobile monitoring and CFD modeling. *Atmosphere*, MDPI, 9, 92.

134. Park, J., P. Billant, J.-J. Baik, and J. M. Seo, 2018: Competition between the centrifugal and strato-rotational instabilities in the stratified Taylor-Couette flow. *Journal of Fluid Mechanics*, 840, 5-24.
133. Lkhamjav, J., Y.-L. Jeon, H. Lee, J.-J. Baik, and J. M. Seo, 2017: Evaluation of an improved quasi-stochastic collection model through precipitation prediction over north central Mongolia. *Journal of Geophysical Research: Atmospheres*, 122, 13404-13419.
132. Han, B.-S., K.-H. Kwak, and J.-J. Baik, 2017: Analysis on vortex streets behind a square cylinder at high Reynolds number using a large-eddy simulation model: Effects of wind direction, speed, and cylinder width. *Atmosphere, KMS*, 27, 445-453.
131. Lkhamjav, J., H.-G. Jin, H. Lee, and J.-J. Baik, 2017: A hail climatology in Mongolia. *Asia-Pacific Journal of Atmospheric Sciences*, 53, 501-509.
130. Moon, S., B.-S. Han, J. Park, J. M. Seo, and J.-J. Baik, 2017: Periodicity and chaos of high-order Lorenz systems. *International Journal of Bifurcation and Chaos*, 27, 1750176.
129. Han, B.-S., S.-B. Park, J.-J. Baik, J. Park, and K.-H. Kwak, 2017: Large-eddy simulation of vortex streets and pollutant dispersion behind high-rise buildings. *Quarterly Journal of the Royal Meteorological Society*, 143, 2714-2726.
128. Park, J., P. Billant, and J.-J. Baik, 2017: Instabilities and transient growth of the stratified Taylor-Couette flow in a Rayleigh-unstable regime. *Journal of Fluid Mechanics*, 822, 80-108.
127. Lee, H., and J.-J. Baik, 2017: A physically based autoconversion parameterization. *Journal of the Atmospheric Sciences*, 74, 1599-1616.
126. Seo, J. M., G. Ganbat, and J.-J. Baik, 2017: Dynamics of reversed urban breeze circulation. *Journal of the Atmospheric Sciences*, 74, 1311-1320.
125. Lkhamjav, J., H. Lee, Y.-L. Jeon, and J.-J. Baik, 2017: Examination of an improved quasi-stochastic model for the collisional growth of drops. *Journal of Geophysical Research: Atmospheres*, 122, 1713-1724.
124. Jin, H.-G., H. Lee, J. Lkhamjav, and J.-J. Baik, 2017: A hail climatology in South Korea. *Atmospheric Research*, 188, 90-99.
123. Seo, J. M., G. Ganbat, J.-Y. Han, and J.-J. Baik, 2017: Theoretical calculations of interactions between urban breezes and mountain slope winds in the presence of basic-state wind. *Theoretical and Applied Climatology*, 127, 865-874.

122. Lee, H., and J.-J. Baik, 2016: Effects of turbulence-induced collision enhancement on heavy precipitation: The 21 September 2010 case over the Korean Peninsula. *Journal of Geophysical Research: Atmospheres*, 121, 12319-12342.
121. Han, B.-S., K.-H. Kwak, J.-J. Baik, 2016: Diurnal variations of O₃ and NO₂ concentrations in an urban park in summer: Effects of air temperature and wind speed. *Journal of Korean Society for Atmospheric Environment*, 32, 536-546.
120. Lee, H., and J.-J. Baik, 2016: Effects of uncertainty in graupel terminal velocity on cloud simulation. *Atmosphere, KMS*, 26, 435-444.
119. Lee, S.-H., H. Lee, S.-B. Park, J.-W. Woo, D.-I. Lee, and J.-J. Baik, 2016: Impacts of in-canyon vegetation and canyon aspect ratio on the thermal environment of street canyons: numerical investigation using a coupled WRF-VUCM model. *Quarterly Journal of the Royal Meteorological Society*, 142, 2562-2578.
118. Ganbat, G., and J.-J. Baik, 2016: Wintertime winds in and around the Ulaanbaatar metropolitan area in the presence of a temperature inversion. *Asia-Pacific Journal of Atmospheric Sciences*, 52, 309-325.
117. Park, J., H. Lee, and J.-J. Baik, 2016: Periodic and chaotic dynamics of the Ehrhard-Muller system. *International Journal of Bifurcation and Chaos*, 26, 1630015.
116. Park, J., B.-S. Han, H. Lee, Y.-L. Jeon, and J.-J. Baik, 2016: Stability and periodicity of high-order Lorenz-Stenflo equations. *Physica Scripta*, 91, 065202.
115. Kwak, K.-H., S.-H. Lee, J. M. Seo, S.-B. Park, and J.-J. Baik, 2016: Relationship between rooftop and on-road concentrations of traffic-related pollutants in a busy street canyon: Ambient wind effects. *Environmental Pollution*, 208, 185-197.
114. Ganbat, G., J. M. Seo, J.-Y. Han, and J.-J. Baik, 2015: A theoretical study of the interactions of urban breeze circulation with mountain slope winds. *Theoretical and Applied Climatology*, 121, 545-555.
113. Ganbat, G., and J.-J. Baik, 2015: Local circulations in and around the Ulaanbaatar, Mongolia, metropolitan area. *Meteorology and Atmospheric Physics*, 127, 393-406.
112. Park, J., H. Lee, Y.-L. Jeon, and J.-J. Baik, 2015: Periodicity of the Lorenz-Stenflo equations. *Physica Scripta*, 90, 065201.
111. Park, S.-B., J.-J. Baik, and S.-H. Lee, 2015: Impacts of mesoscale wind on turbulent flow and ventilation in a densely built-up urban area. *Journal of Applied Meteorology and Climatology*, 54, 811-824.

110. Ganbat, G., J.-J. Baik, and Y.-H. Ryu, 2015: A numerical study of the interactions of urban breeze circulation with mountain slope winds. *Theoretical and Applied Climatology*, 120, 123-135.
109. Park, S.-B., J.-J. Baik, and B.-S. Han, 2015: Large-eddy simulation of turbulent flow in a densely built-up urban area. *Environmental Fluid Mechanics*, 15, 235-250.
108. Park, S.-B., K.-H. Kwak, B.-S. Han, G. Ganbat, H. Lee, J. M. Seo, S.-H. Lee, and J.-J. Baik, 2015: Measurements of turbulent flow and ozone at rooftop and sidewalk sites in a high-rise building area. *SOLA*, 11, 1-4.
107. Lee, H., J.-J. Baik, and J.-Y. Han, 2015: Effects of turbulence on warm clouds and precipitation with various aerosol concentrations. *Atmospheric Research*, 153, 19-33.
106. Kwak, K.-H., J.-J. Baik, Y.-H. Ryu, and S.-H. Lee, 2015: Urban air quality simulation in a high-rise building area using a CFD model coupled with mesoscale meteorological and chemistry-transport models. *Atmospheric Environment*, 100, 167-177.
105. Lee, H., J.-J. Baik, and J.-Y. Han, 2014: Effects of turbulence on mixed-phase deep convective clouds under different basic-state winds and aerosol concentrations. *Journal of Geophysical Research: Atmospheres*, 119, 13506-13525.
104. Lee, K.-Y., K.-H. Kwak, Y.-H. Ryu, S.-H. Lee, and J.-J. Baik, 2014: Impacts of biogenic isoprene emission on ozone air quality in the Seoul metropolitan area. *Atmospheric Environment*, 96, 209-219.
103. Park, S.-B., and J.-J. Baik, 2014: Large-eddy simulations of convective boundary layers over flat and urbanlike surfaces. *Journal of the Atmospheric Sciences*, 71, 1880-1892.
102. Han, J.-Y., J.-J. Baik, and H. Lee, 2014: Urban impacts on precipitation. *Asia-Pacific Journal of Atmospheric Sciences*, 50, 17-30.
101. Kwak, K.-H., and J.-J. Baik, 2014: Diurnal variation of NO_x and ozone exchange between a street canyon and the overlying air. *Atmospheric Environment*, 86, 120-128.
100. Woo, S., J.-J. Baik, H. Lee, J.-Y. Han, and J. M. Seo, 2013: Nonhydrostatic effects on convectively forced mesoscale flows. *Atmosphere, KMS*, 23, 293-305.
99. Ganbat, G., J.-Y. Han, Y.-H. Ryu, and J.-J. Baik, 2013: Characteristics of the urban heat island in a high-altitude metropolitan city, Ulaanbaatar, Mongolia. *Asia-Pacific Journal of Atmospheric Sciences*, 49, 535-541.
98. Ryu, Y.-H., J.-J. Baik, and S.-H. Lee, 2013: Effects of anthropogenic heat on ozone air quality in a megacity. *Atmospheric Environment*, 80, 20-30.

97. Park, S.-B., J.-J. Baik, and Y.-H. Ryu, 2013: A large-eddy simulation study of bottom-heating effects on scalar dispersion in and above a cubical building array. *Journal of Applied Meteorology and Climatology*, 52, 1738-1752.
96. Lee, K.-Y., K.-H. Kwak, S.-B. Park, and J.-J. Baik, 2013: Sensitivity of ozone to NO_x and VOCs in a street canyon. *Journal of Korean Society for Atmospheric Environment*, 29, 307-316.
95. Park, S.-B., and J.-J. Baik, 2013: A large-eddy simulation study of thermal effects on turbulence coherent structures in and above a building array. *Journal of Applied Meteorology and Climatology*, 52, 1348-1365.
94. Kwak, K.-H., J.-J. Baik, and K.-Y. Lee, 2013: Dispersion and photochemical evolution of reactive pollutants in street canyons. *Atmospheric Environment*, 70, 98-107.
93. Ryu, Y.-H., and J.-J. Baik, 2013: Daytime local circulations and their interactions in the Seoul metropolitan area. *Journal of Applied Meteorology and Climatology*, 52, 784-801.
92. Lee, H., J.-J. Baik, and J.-Y. Han, 2013: Sensitivity of numerical solutions to time step in a nonlinear atmospheric model. *Journal of the Korean Earth Science Society*, 34, 51-58.
91. Ryu, Y.-H., J.-J. Baik, K.-H. Kwak, S. Kim, and N. Moon, 2013: Impacts of urban land-surface forcing on ozone air quality in the Seoul metropolitan area. *Atmospheric Chemistry and Physics*, 13, 2177-2194.
90. Ryu, Y.-H., J.-J. Baik, and J.-Y. Han, 2013: Daytime urban breeze circulation and its interaction with convective cells. *Quarterly Journal of the Royal Meteorological Society*, 139, 401-413.
89. Ryu, Y.-H., J.-J. Baik, and S.-H. Lee, 2012: Performance comparison of an urban canopy model under different meteorological conditions. *Atmosphere, KMS*, 22, 429-436.
88. Baik, J.-J., K.-H. Kwak, S.-B. Park, and Y.-H. Ryu, 2012: Effects of building roof greening on air quality in street canyons. *Atmospheric Environment*, 61, 48-55.
87. Han, J.-Y., and J.-J. Baik, 2012: Nonlinear effects on convectively forced two-dimensional mesoscale flows. *Journal of the Atmospheric Sciences*, 69, 3391-3404.
86. Ryu, Y.-H., and J.-J. Baik, 2012: Quantitative analysis of factors contributing to urban heat island intensity. *Journal of Applied Meteorology and Climatology*, 51, 842-854.
85. Park, S.-B., J.-J. Baik, S. Raasch, and M. O. Letzel, 2012: A large-eddy simulation study of thermal effects on turbulent flow and dispersion in and above a street canyon. *Journal of Applied Meteorology and Climatology*, 51, 829-841.

84. Han, J.-Y., J.-J. Baik, and A. P. Khain, 2012: A numerical study of urban aerosol impacts on clouds and precipitation. *Journal of the Atmospheric Sciences*, 69, 504-520.
83. Kwak, K.-H., and J.-J. Baik, 2012: A CFD modeling study of the impacts of NO_x and VOC emissions on reactive pollutant dispersion in and above a street canyon. *Atmospheric Environment*, 46, 71-80.
82. Kwak, K.-H., J.-J. Baik, S.-H. Lee, and Y.-H. Ryu, 2011: Computational fluid dynamics modelling of the diurnal variation of flow in a street canyon. *Boundary-Layer Meteorology*, 141, 77-92.
81. Ryu, Y.-H., J.-J. Baik, and S.-H. Lee, 2011: A new single-layer urban canopy model for use in mesoscale atmospheric models. *Journal of Applied Meteorology and Climatology*, 50, 1773-1794.
80. Kwak, K.-H., Y.-H. Ryu, and J.-J. Baik, 2011: Temporal and spatial variations of NO_x and ozone concentrations in Seoul during the solar eclipse of 22 July 2009. *Journal of Applied Meteorology and Climatology*, 50, 500-506.
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