CURRICULUM VITAE

YOUNG-HA KIM

CONTACT INFORMATION

Institute for Atmosphere and Environment,
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EMPLOYMENT

Postdoctoral Researcher

- Institute for Atmosphere and Environment, Goethe University Frankfurt am Main, Germany (May 2018 – present) / Research group: *Theory of Atmospheric Dynamics and Climate*
- Severe Storm Research Center, Ewha Womans University, South Korea (Mar. 2016 – Apr. 2018) / *Atmospheric Dynamics Research Group*
- Department of Atmospheric Sciences, Yonsei University, South Korea (Sep. 2014 – Feb. 2016) / *Lab. for Atmospheric Dynamics*

EDUCATION

Ph. D. in Atmospheric Sciences (Mar. 2008 – Aug. 2014)

- Department of Atmospheric Sciences, Yonsei University, South Korea
- Advisor: Prof. Hye-Yeong Chun
- Thesis title: *Equatorial planetary and gravity waves in the stratosphere and their contribution to the QBO*

M. Sc. in Atmospheric Sciences (Mar. 2006 – Feb. 2008)

- Department of Atmospheric Sciences, Yonsei University, South Korea
- Advisor: Prof. Hye-Yeong Chun
- Thesis title: *Characteristics of mesospheric gravity waves in Korean Peninsula and the effects of the secondary waves*

B. Sc. in Atmospheric Sciences (Mar. 2002 – Feb. 2006)

- Department of Atmospheric Sciences, Yonsei University, South Korea

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HONORS / AWARDS

- WMO Professor Mariolopoulos Trust Fund Award (2018)
- European Geosciences Union (EGU) Outstanding Student Poster (OSP) Awards (2014)
- Korean Meteorological Society Excellent Dissertation Awards (2014)
- Graduate School of Yonsei University Dissertation Awards (2014)
- Ph. D. Scholarship by Lotte Foundation (2008–2009)

RESEARCH PROJECTS

Researcher

- 2020 – present: *Role of the Middle Atmosphere in Climate (ROMIC-II)* [BMBF]
- 2018 – 2020: *Multiscale Dynamics of Gravity Waves (MS-GWaves)* [DFG]

Principal Investigator

- 2015 – 2017: *Investigation of the Quasi-Biennial Oscillation effect on the midlatitude climate over Asia* [NRF]

Researcher

- 2012 – 2014: *Effects of Convective Gravity Wave Parameterization in a Climate Change Prediction Model* [KMA]
- 2013 – 2014: *Development and Implementation of Parameterization of Gravity Waves from Jet/Front System* [KIAPS]
- 2009 – 2010: *Development of Next-Generation Numerical Weather Prediction Model (I, II)* [KMA]
- 2006 – 2009: *Development of Next-Generation Gravity-Wave Parameterization* [National Research Laboratory Program / NRF]

BMBF: Federal Ministry of Education and Research of Germany
DFG: German Research Foundation
NRF: National Research Foundation of Korea
KMA: Korea Meteorological Administration
KIAPS: Korea Institute of Atmospheric Prediction Systems

OTHER RESEARCH ACTIVITIES

Stratosphere-Troposphere Processes And Their Role in Climate (SPARC) activities

- 2014 – present: **SPARC QBO initiative (QBOi)** — *Towards Improving the Quasi-Biennial Oscillation in Global Climate Models*
  (coordinators: S. Osprey, N. Butchart, K. Hamilton, and J. Anstey)
  Role: contributor/author
  - *Butchart et al.* (2018); *Smith et al.* (2019); *Bushell et al.* (2020); *Stockdale et al.* (2020); *Holt et al.* (2020); *Anstey et al.* (2021)
- 2014 – present: **SPARC Reanalysis Intercomparison Project (S-RIP)**
  (coordinators: M. Fujiwara, G. Manney, L. Gray, and J. Wright)
  Role: contributor/author
  - *Chap. 8: Tropical Tropopause Layer* / *Chap. 9: Quasi-Biennial Oscillation*
  - *Kim et al.* (2019); *Kim and Chun* (2015b)
  - Full report: *Fujiwara et al.* (2021)

Visitings for Collaborative Work

- Stratosphere and Large-Scale Dynamics group, Met Office, Exeter, UK (Drs. David R. Jackson and Andrew C. Bushell): Feb. – Apr. 2012
  - *Kim et al.* (2013)
- Institute for Energy and Climate – Stratosphere, Juelich Research Center, Juelich, Germany (Drs. Peter Preusse and Manfred Ern): May – Nov. 2011
  - *Kim et al.* (2012) ; *Lehmann et al.* (2012)

RESEARCH INTERESTS

- Atmospheric wave dynamics
- Wave–mean-flow interaction in the large-scale circulation and its modeling
- Role of the middle atmosphere dynamics in climate modeling
- Role of the middle atmospheric variability in seasonal prediction
- Quasi-biennial oscillation (QBO) dynamics, variability, and modeling

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PUBLICATIONS

International Journal Articles

Kim, Y.-H., and U. Achatz, 2021: Interaction between stratospheric Kelvin waves and gravity waves in the easterly QBO phase. *Geophys. Res. Lett.*, 48(18), e2021GL095226, doi:10.1029/2021GL095226.

Anstey, J. A., I. R. Simpson, J. H. Richter, H. Naoe, M. Taguchi, F. Serva, L. J. Gray, N. Butchart, K. Hamilton, S. Osprey, O. Bellprat, P. Braesicke, A. C. Bushell, C. Cagnazzo, C.-C. Chen, H.-Y. Chun, R. R. Garcia, L. Holt, Y. Kawatani, T. Kerzenmacher, Y.-H. Kim, F. Lott, C. McLandress, J. Scinocca, T. N. Stockdale, S. Versick, S. Watanabe, K. Yoshida, and S. Yukimoto, 2021: Teleconnections of the quasi-biennial oscillation in a multi-model ensemble of QBO-resolving models. *Q. J. R. Meteorol. Soc.*, doi:10.1002/qj.4048.

Stockdale, T. N., Y.-H. Kim, J. A. Anstey, F. Palmeiro, N. Butchart, A. A. Scaife, M. Andrews, A. C. Bushell, M. Dobrynin, J. Garcia-Serrano, K. Hamilton, Y. Kawatani, F. Lott, C. McLandress, H. Naoe, S. Osprey, H. Pohlmann, J. Scinocca, S. Watanabe, K. Yoshida, and S. Yukimoto, 2020: Prediction of the quasi-biennial oscillation with a multi-model ensemble of QBO-resolving models. *Q. J. R. Meteorol. Soc.*, doi:10.1002/qj.3919.

Holt, L. A., F. Lott, R. R. Garcia, G. N. Kiladis, Y.-M. Cheng, J. A. Anstey, P. Braesicke, A. C. Bushell, N. Butchart, C. Cagnazzo, C.-C. Chen, H.-Y. Chun, Y. Kawatani, T. Kerzenmacher, Y.-H. Kim, C. McLandress, H. Naoe, S. M. Osprey, J. H. Richter, A. A. Scaife, J. Scinocca, F. Serva, S. Versick, S. Watanabe, K. Yoshida, and S. Yukimoto, 2020: An evaluation of tropical waves and wave forcing of the QBO in the QBOi models.

Q. J. R. Meteorol. Soc., doi:10.1002/qj.3827.

Bushell, A. C., J. A. Anstey, N. Butchart, Y. Kawatani, S. M. Osprey, J. H. Richter, F. Serva, P. Braesicke, C. Cagnazzo, C.-C. Chen, H.-Y. Chun, R. R. Garcia, L. J. Gray, K. Hamilton, T. Kerzenmacher, Y.-H. Kim, F. Lott, C. McLandress, H. Naoe, J. Scinocca, A. K. Smith, T. N. Stockdale, S. Versick, S. Watanabe, K. Yoshida, and S. Yukimoto, 2020: Evaluation of the Quasi-Biennial Oscillation in global climate models for the SPARC QBO-initiative. *Q. J. R. Meteorol. Soc.*, doi:10.1002/qj.3765.

Smith, A. K., L. A. Holt, R. R. Garcia, J. A. Anstey, F. Serva, N. Butchart, S. Osprey, A. C. Bushell, Y. Kawatani, Y.-H. Kim, F. Lott, P. Braesicke, C. Cagnazzo, C.-C. Chen, H.-Y. Chun, L. Gray, T. Kerzenmacher, H. Naoe, J. Richter, S. Versick, V. Schenzinger, S. Watanabe, and K. Yoshida, 2019: The equatorial stratospheric semiannual oscillation and time-mean winds in QBOi models. *Q. J. R. Meteorol. Soc.*, doi:10.1002/qj.3690.

Kim, Y.-H., G. Bölöni, S. Borchert, H.-Y. Chun, and U. Achatz, 2021: Toward transient subgrid-scale gravity wave representation in atmospheric models. Part II: Wave intermittency simulated with convective sources. *J. Atmos. Sci.*, 78(4), 1339–1357, doi:10.1175/JAS-D-20-0066.1.

Bölöni, G., Y.-H. Kim, S. Borchert, and U. Achatz, 2021: Toward transient subgrid-scale gravity wave representation in atmospheric models. Part I: Propagation model including nondissipative wave-mean-flow interactions. *J. Atmos. Sci.*, 78(4), 1317–1338, doi:10.1175/JAS-D-20-0065.1.

Chun, H.-Y., B.-G. Song, S.-W. Shin, and Y.-H. Kim, 2019: Gravity waves associated with jet/front systems. Part I: Diagnostics and their correlations with GWs revealed in high-resolution global analysis data. *Asia-Pacific J. Atmos. Sci.*, 55(4), 589–608, doi:10.1007/S13143-019-00104-1.

Kim, Y.-H., G. N. Kiladis, J. R. Albers, J. Dias, M. Fujiwara, J. A. Anstey, I.-S. Song, C. J. Wright, Y. Kawatani, F. Lott, and C. Yoo, 2019: Comparison of equatorial wave activity in the tropical tropopause layer and stratosphere represented in reanalyses. *Atmos. Chem. Phys.*, 19(15), 10027–10050, doi:10.5194/ACP-19-10027-2019.

Koo, J.-H., T. Choi, H. Lee, J. Kim, D. H. Ahn, J. Kim, Y.-H. Kim, C. Yoo, H. Hong, K.-J. Moon, and Y. G. Lee, 2018: Total ozone characteristics associated with regional meteorology in West Antarctica. *Atmos. Environ.*, 195, 78–88, doi:10.1016/J.ATMOSENV.2018.09.056.

Yoo, J.-H., T. Choi, H.-Y. Chun, Y.-H. Kim, I.-S. Song, and B.-G. Song, 2018: Inertia-gravity waves revealed in radiosonde data at Jang Bogo Station, Antarctica (74°37′S, 164°13′E): 1. Characteristics, energy, and momentum flux. *J. Geophys. Res.*, 123(23), 13305–13331, doi:10.1029/2018JD029164.

Kang, M.-J., H.-Y. Chun, Y.-H. Kim, P. Preusse, and M. Ern, 2018: Momentum flux of convective gravity waves derived from an offline gravity wave

parameterization. Part II: Impacts on the quasi-biennial oscillation. *J. Atmos. Sci.*, 75(11), 3753–3775, doi:10.1175/JAS-D-18-0094.1.

Yoo, C., N. C. Johnson, C.-H. Chang, S. B. Feldstein, and Y.-H. Kim, 2018: Subseasonal prediction of wintertime East Asian temperature based on atmospheric teleconnections. *J. Clim.*, 31(22), 9351–9366, doi:10.1175/JCLI-D-17-0811.1.

Song, I.-S., H.-Y. Chun, G. Jee, S.-Y. Kim, J. Kim, Y.-H. Kim, and M. A. Taylor, 2018: Dynamic initialization for whole atmospheric global modeling. *J. Adv. Model. Earth Syst.*, 10(9), 2096–2120, doi:10.1029/2017MS001213.

Choi, H.-J., J.-Y. Han, M.-S. Koo, H.-Y. Chun, Y.-H. Kim, and S.-Y. Hong, 2018: Effects of non-orographic gravity wave drag on seasonal and medium-range predictions in a global forecast model. *Asia-Pacific J. Atmos. Sci.*, 54(S1), 385–402, doi:10.1007/S13143-018-0023-1.

Butchart, N., J. A. Anstey, K. Hamilton, S. Osprey, C. McLandress, A. C. Bushell, Y. Kawatani, Y.-H. Kim, F. Lott, J. Scinocca, T. N. Stockdale, M. Andrews, O. Bellprat, P. Braesicke, C. Cagnazzo, C.-C. Chen, H.-Y. Chun, M. Dobrynin, R. R. Garcia, J. Garcia-Serrano, L. J. Gray, L. Holt, T. Kerzenmacher, H. Naoe, H. Pohlmann, J. H. Richter, A. A. Scaife, V. Schenzinger, F. Serva, S. Versick, S. Watanabe, K. Yoshida, and S. Yukimoto, 2018: Overview of experiment design and comparison of models participating in phase 1 of the SPARC Quasi-Biennial Oscillation initiative (QBOi). *Geosci. Model Dev.*, 11(3), 1009–1032, doi:10.5194/GMD-11-1009-2018.

Kang, M.-J., H.-Y. Chun, and Y.-H. Kim, 2017: Momentum flux of convective gravity waves derived from an offline gravity wave parameterization. Part I: Spatiotemporal variations at source level. *J. Atmos. Sci.*, 74(10), 3167–3189, doi:10.1175/JAS-D-17-0053.1.

Song, I.-S., C. Lee, J.-H. Kim, G. Jee, Y.-H. Kim, H.-J. Choi, H.-Y. Chun, and Y. H. Kim, 2017: Meteor radar observations of vertically propagating low-frequency inertia-gravity waves near the southern polar mesopause region. *J. Geophys. Res.*, 122(4), 4777–4800, doi:10.1002/2016JA022978.

Kim, Y.-H., H.-Y. Chun, S.-H. Park, I.-S. Song, and H.-J. Choi, 2016: Characteristics of gravity waves generated in the jet-front system in a baroclinic instability simulation. *Atmos. Chem. Phys.*, 16(8), 4799–4815, doi:10.5194/ACP-16-4799-2016.

Kim, Y.-H., and H.-Y. Chun, 2015: Momentum forcing of the quasi-biennial oscillation by equatorial waves in recent reanalyses. *Atmos. Chem. Phys.*, 15(12), 6577–6587, doi:10.5194/ACP-15-6577-2015.

Kim, Y.-H., and H.-Y. Chun, 2015: Contributions of equatorial wave modes and parameterized gravity waves to the tropical QBO in HadGEM2. *J. Geophys. Res.*, 120(3), 1065–1090, doi:10.1002/2014JD022174.

Kim, Y.-H., A. C. Bushell, D. R. Jackson, and H.-Y. Chun, 2013: Impacts of introducing a convective gravity-wave parameterization upon the QBO in the Met Office Unified Model. *Geophys. Res. Lett.*, 40(9), 1873–1877, doi:10.1002/GRL.50353.

Lehmann, C. I., Y.-H. Kim, P. Preusse, H.-Y. Chun, M. Ern, and S.-Y. Kim, 2012: Consistency between Fourier transform and small-volume few-wave decomposition for spectral and spatial variability of gravity waves above a typhoon. *Atmos. Meas. Tech.*, 5(7), 1637–1651, doi:10.5194/AMT-5-1637-2012.

Kim, Y.-H., H.-Y. Chun, P. Preusse, M. Ern, and S.-Y. Kim, 2012: Gravity wave reflection and its influence on the consistency of temperature- and wind-based momentum fluxes simulated above Typhoon Ewiniar. *Atmos. Chem. Phys.*, 12(22), 10787–10795, doi:10.5194/ACP-12-10787-2012.

Chun, H.-Y., Y.-H. Kim, H.-J. Choi, and J.-Y. Kim, 2011: Influence of gravity waves in the tropical upwelling: WACCM simulations. *J. Atmos. Sci.*, 68(11), 2599–2612, doi:10.1175/JAS-D-11-022.1.

Kim, Y.-H., and H.-Y. Chun, 2009: Effects of the basic-state wind on secondary waves generated by the breaking of gravity waves in the mesosphere. *Asia-Pacific J. Atmos. Sci.*, 45(1), 91–100.

Chun, H.-Y., and Y.-H. Kim, 2008: Secondary waves generated by breaking of convective gravity waves in the mesosphere and their influence in the wave momentum flux. *J. Geophys. Res.*, 113, D23107, doi:10.1029/2008JD009792.

Chun, H.-Y., J.-S. Goh, and Y.-H. Kim, 2007: Characteristics of inertio-gravity waves revealed in rawinsonde data observed in Korea during 20 August to 5 September 2002. *J. Geophys. Res.*, 112, D16108, doi:10.1029/2006JD008348.

Domestic Journal Articles (in Korean)

Kim, D.-K., Y.-H. Kim, and C. Yoo, 2019: Predictability of northern hemisphere teleconnection patterns in GloSea5 hindcast experiments up to 6 weeks. *Atmosphere (KMS)*, 29(3), 295–309, doi:10.14191/ATMOS.2019.29.3.295.

Reports

Tegtmeier, S., K. Krüger, T. Birner, N. Davis, S. Davis, M. Fujiwara, C. Homeyer, Y.-H. Kim, G. Manney, E. Nishimoto, M. Nützel, R. Pilch Kedzierski, F. Ploeger, X. Sun, J. Wang, T. Wang, and J. Wright, 2021: Chap. 8: Tropical Tropopause Layer. *In SPARC Reanalysis Intercomparison Project (S-RIP) Final Report*, doi:10.17874/800dee57d13.

Anstey, J. A., L. J. Gray, M. Fujiwara, I. Ivanciu, Y. Kawatani, G. Kiladis, Y.-H. Kim, P. Martineau, V. Schenzinger, S. Tegtmeier, and C. Wright, 2021:

Chap. 9: Quasi-Biennial Oscillation. *In SPARC Reanalysis Intercomparison Project (S-RIP) Final Report*, doi:10.17874/800dee57d13.