

Toshiki Iwasaki

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Education

Ph.D., Physics, Graduate School of Science, Tohoku University, 1977.4~1980.4
M. C., Physics, Graduate School of Science, Tohoku University, 1975.4~1977.3

Employment

2023.10- Academic Researcher & Emeritus Professor, Graduate School of Science, Tohoku University
2022.4-2023.9 Visiting Researcher & Emeritus Professor, Graduate School of Science, Tohoku University
2018.4-2022.3 Research Professor & Emeritus Professor, Graduate School of Science, Tohoku University
1998.4-2018.3 Professor, Graduate School of Science, Tohoku University
1997.4-1998.3 Chief Scientist, Numerical Prediction Division, Japan Meteorological Agency
1983.4-1997.4 Scientist, Numerical Prediction Division, Japan Meteorological Agency
1980.4-1983.3 Technical Official, Sapporo District Observatory, Japan Meteorological Agency
*1987.6-1988.5 Visiting Scientist, National Center for Atmospheric Research, in Boulder, Colorado, USA

Community Services

2016~2020: President, Meteorological Society of Japan
2008~2016: Chair, Committee of Scientific Activities, Meteorological Society of Japan
2004~2008: Editor in Chief, Journal of Meteorological Society of Japan (JMSJ)
2000~2020: Board, Meteorological Society of Japan

Honors

2022, The Fujiwara Award of Meteorological Society of Japan:

Outstanding research on atmospheric dynamics and numerical modeling, and contribution to meteorology and numerical weather prediction

2012, SOLA Paper Award

Mass-Weighted Isentropic Zonal Mean Equatorward Flow in the Northern Hemispheric Winter by T. Iwasaki and Y. Mochizuki (SOLA, 8, 115-118, doi:10.2151/sola.2012-029)

2008, The Japan Meteorological Society Award

The world of mass-weighted isentropic zonal means (MIM) – Atmospheric General Circulation Viewed from Wave-Mean Flow Interactions–

Publications (Refereed Papers)

1. Suzuki, S.-I., H. Morooka, H., Yamazaki, T., Iwasaki, T., 2024: Future Projection of Extremely Heavy Rainfall in the Tohoku District of Japan with Large Ensemble Simulations Using the 5 km Regional Climate Model, J. Disaster Res., 19, 991–1005. <https://doi.org/10.20965/jdr.2024.p0991>.
2. Kobayashi, C., T. Iwasaki, 2024: The Brewer–Dobson circulation in the JRA-3Q reanalysis and the impact of changes in model physical processes, Quart. J. Roy. Meteor. Soc. 150(765), 5605–5620. <https://doi.org/10.1002/qj.4896>.
3. FUKUI, S., E. SHIRAKAWA, D. SOGA, R. OHARA, K. USUI, K. TAKIGUCHI, K. ONO, T. HIROSE, S. MATSUSHIMA, J. ITO, T. YAMAZAKI, K. SAITO, H. SEKO, T. IWASAKI, 2024: Long-Term Regional Reanalysis for Japan with Assimilating Conventional Observations (RRJ-Conv), J. Meteor. Soc. Japan, 102, 677–696. <https://doi.org/10.2151/jmsj.2024-036>.
4. Seto, S., J. Okuyama, T. Iwasaki, Y. Fukuda, T. Matsuzawa, K. Ito, H. Takakura, K. Terada and F. Imamura, 2024: Linking affected community and academic knowledge: a community-based participatory research framework based on a Shichigahama project, Sci Rep 14, 19910. <https://doi.org/10.1038/s41598-024-70813-9>.

5. Maulana, M.T., T. Yamazaki, T. Iwasaki, M. R. Abdillah, 2023: Regional variation of the influence of cross-equatorial northerly surge towards diurnal cycle of rainfall over Java Island, *Geosci. Lett.* 10, 40. <https://doi.org/10.1186/s40562-023-00293-8>.
6. Kuramochi, M., H. Ueda, T. Iwasaki, K. Takaya, 2023: Interannual Variability of the Mass-Weighted Isentropic Zonal Mean Meridional Circulation in the Northern Hemisphere Winter, *J. Clim.* 36, 5605-5618. <https://doi.org/10.1175/JCLI-D-22-0895.1>.
7. Liu, Q., G. Chen, L. Sheng, T. Iwasaki, 2022: Rapid reappearance of air pollution after cold air outbreaks in northern and eastern China. *Atmos. Chem. Phys.*, 22, 13371–13388. <https://doi.org/10.5194/acp-22-13371-2022>.
8. Usui, K., T. Iwasaki, T. Yamazaki, J. Ito, 2022: Numerical Simulations and Trajectory Analyses of Local Karakaze Wind: A Case That Could Have Contributed to an Aircraft Accident at Narita Airport on 23 March 2009, *SOLA*, 18, 140-146. <https://doi.org/10.2151/sola.2022-023>.
9. Kanno, Y., T. Iwasaki, 2022: Future changes of atmospheric energy cycle in CMIP5 climate models. *J. Geophys. Res. atmosphere*, e2021JD036380. <https://doi.org/10.1029/2021JD036380>
10. Kobayashi, C., S. Maeda, Y. Kanno, and T. Iwasaki, 2022: Extremely weak cold-air mass flux and extratropical direct meridional circulation linked to the record-warm winter 2019/2020 over East Asia. *SOLA*, 18, 1–7, doi:10.2151/sola.2022-001. <https://doi.org/10.2151/sola.2022-001>
11. Ohara, R., T. Iwasaki, and T. Yamazaki, 2021: Impacts of evaporative cooling from raindrops on the frontal heavy rainfall formation over western Japan on 5–8 July 2018. *J. Meteor. Soc. Japan*, 99, 1351–1369, <https://doi.org/10.2151/jmsj.2021-065>
12. Liu, Q., G. Chen, Y. Kanno, & T. Iwasaki, 2021: Southward Cold Airmass Flux Associated with the East Asian Winter Monsoon: Diversity and Impacts. *J. Clim.* 34, 3239–3254. DOI: <https://doi.org/10.1175/JCLI-D-20-0319.1>
13. Kento SUZUKI, Toshiki IWASAKI, Takeshi YAMAZAKI, 2021: Analysis of Systematic Error in Numerical Weather Prediction of Coastal Fronts in Japan's Kanto Plain, *J. Meteorol. Soc. Japan. Ser. II*, 99, 27-47. DOI: <https://doi.org/10.2151/jmsj.2021-002>
14. Muhammad R. A., Y. Kanno, T. Iwasaki, and J. Matsumoto, 2021: Cold Surge Pathways in East Asia and Their Tropical Impacts. *J. Clim.* 34, 157-170. DOI: <https://doi.org/10.1175/JCLI-D-20-0552.1>
15. Liu, Q., Chen, G., & Iwasaki, T., 2020: Long-term trends and impacts of polar cold airmass in boreal summer. *Environ. Res. Lett.* 15 084042. <https://doi.org/10.1088/1748-9326/ab986d>
16. Okuyama, J., H. Sasaki, S. Seto, Y. Fukuda, T. Iwasaki, T. Matsuzawa, K. Ito, T. Izumi, H. Takakura, F. Imamura, and T. Ishi, 2020: WBF-2019 Core Research Cluster of Disaster Science Planning Session as Disaster Preparedness: Participation in a Training Program for Conductor-Type Disaster Healthcare Personnel, *J. Disaster Res.*, 15, 900–912. <http://doi.org/10.20965/jdr.2020.p0900>.
17. Aono, K., T. Iwasaki, and T. Sasai, 2020: Effects of wind-evaporation feedback in outer regions on tropical cyclone development. *J. Meteor. Soc. Japan*, 98, 319–328, <https://doi.org/10.2151/jmsj.2020-017>
18. Kanno, Y., & Iwasaki, T., 2020: Future reductions in polar cold air mass and cold air outbreaks revealed from isentropic analysis. *Geophys. Res. Lett.*, 47, e2019GL086076. <https://doi.org/10.1029/2019GL086076>
19. Sasai, T., H. Kawase, H., Kanno, Y., J. Yamaguchi, S. Sugimoto, T. Yamazaki, H. Sasaki, M. Fujita, T. Iwasaki, 2019: Future projection of extreme heavy snowfall events with a5 - km large ensemble regional climate simulation. *J. Geophys. Res. Atmos.*, 124, 975–13,990. <https://doi.org/10.1029/2019JD030781>
20. Liu, Q., Chen, G., & Iwasaki, T., 2019: Quantifying the impacts of cold airmass on aerosol concentrations over North China using isentropic analysis. *J. Geophys. Res. Atmos.*, 124, 7308–7326. <https://doi.org/10.1029/2018JD029367>
21. Iwasaki, T., T. Thomas Sekiyama, T. Nakajima, A. Watanabe, Y. Suzuki, H. Kondo, Y. Morino, H. Terada, H. Nagaih, M. Takigawa, H. Yamazawa, D. Quélok, A. Mathieuk, 2019: Intercomparison of numerical atmospheric dispersion prediction models for emergency response to emissions of radionuclides with limited source information in the Fukushima Dai-ichi nuclear power plant accident. *Atmos. Environ.* 214, 1 October 2019, 116830. <https://doi.org/10.1016/j.atmosenv.2019.116830>
22. Shimpo, A., Takemura, K., Wakamatsu, S., Togawa, H., Mochizuki, Y., Takekawa, M., Tanaka, S., Yamashita, K., Maeda, M., Kurora, R., Murai, M., Kitabatake, N., Tsuguti, H., Mukougawa, H., Iwasaki, T., Kawamura, R., Kimoto, M., Takayabu, I., Takayabu, Y. N., Tanimoto, Y., Hirooka, Y., Masumoto, Y., Watanabe, M., Tsuboki, K., Nakamura, H., 2019: Primary Factors behind the Heavy Rain Event of July 2018 and the Subsequent Heat Wave in Japan. *SOLA*. 2019, 15A, 13-18. <https://doi.org/10.2151/sola.15A-003>

23. Kanno, Y., J. Walsh, M. R. Abdillah, J. Yamaguchi, T. Iwasaki, 2019: Indicators and trends of polar cold air mass. *Environ. Res. Lett.*, 14. <https://dx.doi.org/10.1088/1748-9326/aaf42b>
24. Yamaguchi, J., Y. Kanno, G. Chen, T. Iwasaki, 2019: Cold Air Mass Analysis of the Record-Breaking Cold Surge Event over East Asia in January 2016. *J. Meteor. Soc. Japan*, 97(1), 275-293. DOI; <https://doi.org/10.2151/jmsj.2019-015>
25. Chen, G., H. Iwai, S. Ishii, K. Saito, H. Seko, W. Sha, and T. Iwasaki, 2019: Structures of the sea - breeze front in dual - Doppler lidar observation and coupled mesoscale - to - LES modeling. *J. Geophys. Res. Atmos.*, 124, <https://doi.org/10.1029/2018JD029017>
26. Fukui, S., T. Iwasaki, K. Saito, H. Seko, M. Kunii, 2018: A Feasibility Study on the High-Resolution Regional Reanalysis over Japan Assimilating Only Conventional Observations as an Alternative to the Dynamical Downscaling. *J. Meteor. Soc. Japan*, 96 (6), 565-585. DOI; <https://doi.org/10.2151/jmsj.2018-056>
27. Abdillah, M.R., Kanno, Y., Iwasaki, T., 2018: Strong Linkage of El Niño–Southern Oscillation to the Polar Cold Air Mass in the Northern Hemisphere. *Geophys. Res. Lett.*, 45, 5643-5652. <https://doi.org/10.1029/2018GL077612>
28. Kanno, Y., Iwasaki, T., 2018: Three-dimensional structure of mass-weighted isentropic time-mean meridional circulations. *J. Atmos. Sci.*, 75, 2029-2047. DOI: <https://doi.org/10.1175/JAS-D-17-0154.1>
29. Sekiyama, T.T., Iwasaki, T., 2018: Mass flux analysis of ¹³⁷Cs plumes emitted from the Fukushima Daiichi nuclear power plant. *Tellus B.*, 70. <https://doi.org/10.1080/16000889.2018.1507390>
30. Indira, K., T. Yamazaki, T. Iwasaki and Muhammad Rais Abdillah, 2018: Projection of future monsoon precipitation over the central Himalayas by CMIP5 models under warming scenarios. *Climate Res.*, 75, DOI: <https://doi.org/10.3354/cr01497>
31. Shimada, T., Y. Kanno and T. Iwasaki, 2018: Low-level cool air over the mid-latitude oceans in summer. *J. Climate* 31(5), 2075-2090. <https://doi.org/10.1175/JCLI-D-17-0188.1>
32. Muhammad Rais Abdillah, Y. Kanno and T. Iwasaki, 2018: Tropical-extratropical interactions associated with East Asian cold air outbreaks. Part II: Intraseasonal variation. *J. Climate*, 31(2), 473-490. <https://doi.org/10.1175/JCLI-D-17-0147.1>
33. Kanno, Y., J. Walsh, T. Iwasaki, 2017: Interannual Variability of the North American Cold Air Stream and Associated Synoptic Circulations. *J. Climate*, 30(23), 9575-9590. <https://doi.org/10.1175/JCLI-D-17-0104.1>
34. Baron, P., S. Ishii, K. Okamoto, K. Gamo, K. Mizutani, C. Takahashi, T. Itabe, T. Iwasaki, T. Kubota, T. Maki, R. Oki, S. Ochiai, D. Sakaizawa, M. Satoh, Y. Satoh, T. Y. Tanaka, and M. Yasui, 2017: Feasibility study for future spaceborne coherent Doppler Wind Lidar. Part 2: Measurement simulation algorithms and retrieval error characterization. *J. Meteor. Soc. Japan*, 95, 319-342. <http://doi.org/10.2151/jmsj.2017-018>
35. Ishii, S., P. Baron, M. Aoki, K. Mizutani, M. Yasui, S. Ochiai, A. Sato, Y. Satoh, T. Kubota, D. Sakaizawa, R. Oki, K. Okamoto, T. Ishibashi, T. Y. Tanaka, T. T. Sekiyama, T. Maki, K. Yamashita, T. Nishizawa, M. Satoh, and T. Iwasaki, 2017: Feasibility study for future space-borne coherent Doppler wind lidar. Part 1: Instrumental overview for global wind profile observation. *J. Meteor. Soc. Japan*, 95, 301-317. <http://doi.org/10.2151/jmsj.2017-017>.
36. G. Chen, W. Sha, T. Iwasaki, and Z. Wen, 2017: Diurnal Cycle of a Heavy Rainfall Corridor over East Asia, *Mon. Wea. Rev.*, 145, 3369-3385. <https://doi.org/10.1175/MWR-D-16-0423.1>
37. Abdillah, M. R., Y. Kanno, and T. Iwasaki, 2017: Tropical–Extratropical Interactions Associated with East Asian Cold Air Outbreaks. Part I: Interannual Variability, *J. Climate*, 30, 2989-3007. <http://dx.doi.org/10.1175/JCLI-D-16-0152.1>
38. Kinoshita, T., T. Iwasaki and K. Sato, 2016: A Formulation of Three Dimensional Wave Activity Flux Describing Wave Propagation on the Mass-Weighted Isentropic Time Mean Equation. *SOLA*, 2016, Vol. 12, 198–202, <http://dx.doi.org/10.2151/sola.2016-040>
39. Koumoto, T., N. Saito, N. Aoki, T. Iwasaki, S. Kawai, S. Yokoi & H. Shimono, 2016: Effects of salt and low light intensity during the vegetative stage on susceptibility of rice to male sterility induced by chilling stress during the reproductive stage. *Plant Production Science*, DOI: <http://dx.doi.org/10.1080/1343943X.2016.1190283>
40. Kanno, Y., M. R. Abdillah, and T. Iwasaki, 2016: Long-term trend of cold air mass amount below a designated potential temperature in Northern and Southern Hemispheric winters using reanalysis data sets, *J. Geophys. Res. Atmos.*, 121, 10,138–10,152, <http://dx.doi.org/10.1002/2015JD024635>
41. Miyazaki, K., T. Iwasaki, Y. Kawatani, C. Kobayashi, S. Sugawara, and M. I. Hegglin, 2016: Inter-comparison of

- stratospheric mean-meridional circulation and eddy mixing among six reanalysis data sets, *Atmos. Chem. Phys.*, 16, 6131-6152. <http://www.atmos-chem-phys.net/16/6131/2016/> <http://dx.doi.org/10.5194/acp-16-6131-2016>
42. Coronel, R., M. Sawada, and T. Iwasaki, 2016: Impacts of surface drag coefficient and vertical mixing schemes on the structure and energetics of Tropical Cyclone Megi (2010) during intensification. *J. Meteor. Soc. Japan*, 94, 55-73. <http://doi.org/10.2151/jmsj.2016-004>
43. Kobayashi, C., and T. Iwasaki, 2016: Brewer - Dobson circulation diagnosed from JRA-55, *J. Geophys. Res. Atmos.*, 121, 1494-1510. <http://dx.doi.org/10.1002/2015JD023476>.
44. Ishii, S., K. Okamoto, P. Baron, T. Kubota, Y. Satoh, D. Sakaizawa, T. Ishibashi, T. Y. Tanaka, K. Yamashita, S. Ochiai, K. Gamo, M. Yasui, R. Oki, M. Satoh, T. Iwasaki, 2016: Measurement Performance Assessment of Future Space-Borne Doppler Wind Lidar for Numerical Weather Prediction, *SOLA*, 12, 55-59. <http://doi.org/10.2151/sola.2016-012>
45. Kanno, Y., M. R. Abdilllah, and T. Iwasaki, 2015: Charge and discharge of polar cold air mass in northern hemispheric winter, *Geophys. Res. Lett.*, 42, doi: <http://dx.doi.org/10.1002/2015GL065626>.
46. Yoshida, R., S. Fukui, T. Shimada, T. Hasegawa, Y. Ishigooka, I. Takayabu, and T. Iwasaki, 2015: An evaluation of rice adaptation to climate change through a cultivar-based simulation: A possible cultivar shift in eastern Japan. *Clim. Res.*, <http://dx.doi.org/10.3354/cr01320>.
47. Shimada, T. and T. Iwasaki, 2015: Two regimes of cloud water over the Okhotsk Sea and the adjacent regions around Japan in summer, *J. Geophys. Res.-Atmos.*, 120, 2407-2418, <http://dx.doi.org/10.1002/2014JD022536>.
48. Sawada, M., T. Sakai, T. Iwasaki, H. Seko, K. Saito and T. Miyoshi, 2015: Assimilating high-resolution winds from a Doppler lidar using an ensemble Kalman filter with lateral boundary adjustment. *Tellus, A*, 67, 23473, <http://dx.doi.org/10.3402/tellusa.v67.23473>.
49. Chen, G., X. Zhu, W. Sha, T. Iwasaki, H. Seko, K. Saito, H. Iwai, and S. Ishii, 2015: Toward improved forecasts of sea-breeze horizontal convective rolls at super high resolutions. Part I: Configuration and verification of a Down-Scaling Simulation System (DS3). *Mon. Wea. Rev.*, 143, 1849-1872, doi: <http://dx.doi.org/10.1175/MWR-D-14-00212.1>
50. Chen, G., X. Zhu, W. Sha, T. Iwasaki, H. Seko, K. Saito, H. Iwai, and S. Ishii, 2015: Toward improved forecasts of sea-breeze horizontal convective rolls at super high resolutions. Part II: The impacts of land use and buildings. *Mon. Wea. Rev.*, 143, 1873-1894, doi: <http://dx.doi.org/10.1175/MWR-D-14-00230.1>
51. Kanno, Y., T. Shoji, and T. Iwasaki, 2015: Comparison study of the polar cold air mass between Northern and Southern Hemispheric winters based on a zonal-mean two-box model. *Atmos. Sci. Lett.*, 16(1), 70-76. doi: <http://dx.doi.org/10.1002/asl2.522>
52. Kanda, E., H. Kanno, S. Okubo, T. Shimada, R. Yoshida, T. Kobayashi, T. Iwasaki, 2014: Estimation of cool summer damage in the Tohoku district based on the MRI AGCM, *J. Agric. Meteor.*, 70, 187-198. <https://doi.org/10.2480/agrmet.D-14-00004>
53. Chen, G., T. Iwasaki, H. Qin, and W. Sha, 2014: Evaluation of the warm-season diurnal variability over East Asia in recent reanalyses JRA-55, ERA-Interim, NCEP CFSR, and NASA MERRA. *J. Climate*, 27(14), 5517-5537. doi: <http://dx.doi.org/10.1175/JCLI-D-14-00005.1>
54. Chen, G., R. Yoshida, W. Sha, T. Iwasaki, and H. Qin, 2014: Convective instability associated with the eastward-propagating rainfall episodes over eastern China during the warm season. *J. Climate*, 27(6), 2331-2339. doi: <http://dx.doi.org/10.1175/JCLI-D-13-00443.1>
55. Fukui, S., T. Iwasaki, and W. Sha, 2014: An Ensemble Downscaling Prediction Experiment for Medium-Range Forecasts of the Daily Mean Surface Temperature Distribution over Northeastern Japan during Summer. *J. Meteor. Soc. Japan*. 92(6), 505-517. doi: <http://dx.doi.org/10.2151/jmsj.2014-601>
56. Shoji, T., Y. Kanno, T. Iwasaki, and K. Takaya, 2014: An isentropic analysis of the temporal evolution of East Asian cold air outbreaks. *J. Climate*, 27(24), 9337-9348. doi: <http://dx.doi.org/10.1175/JCLI-D-14-00307.1>
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58. Iwasaki, T., T. Shoji, Y. Kanno, M. Sawada, M. Ujiie, K. Takaya, 2014: Isentropic Analysis of Polar Cold Air mass Streams in the Northern Hemispheric Winter. *J. Atmos. Sci.*, 71, 2230-2243. doi: <http://dx.doi.org/10.1175/JAS-D-13-058.1>
59. Shimada, T., M. Sawada, and T. Iwasaki, 2014: Indices of Cool Summer Climate in Northern Japan: Yamase

Indices. *J. Meteor. Soc. Japan*, 92, 17-35, <http://dx.doi.org/10.2151/jmsj.2014-102>

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61. Noda, A. T., K. Nakamura, T. Iwasaki, and M. Satoh, 2013: A numerical study of a stratocumulus-topped boundary layer: Relations of decaying clouds with a stability parameter across inversion. *J. Meteor. Soc. Japan*, 91, 727-746. <http://dx.doi.org/10.2151/jmsj.2013-601>
62. Nakamura, T., H. Akiyoshi, M. Deushi, K. Miyazaki, C. Kobayashi, K. Shibata, and T. Iwasaki, 2013: A multi model comparison of stratospheric ozone data assimilation based on an ensemble Kalman filter approach. *J. Geophys. Res. Atmos.*, 118, 3848–3868, doi: <http://dx.doi.org/10.1002/jgrd.50338>
63. Chen, G., W. Sha, M. Sawada, and T. Iwasaki, 2013: Influence of summer monsoon diurnal cycle on moisture transport and precipitation over eastern China. *J. Geophys. Res. Atmos.*, 118, 3163–3177, doi: <http://dx.doi.org/10.1002/jgrd.50337>
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65. Lestari R. K. and T. Iwasaki, 2012: An Empirical Study of the Response of the South China Sea Summer Monsoon to the Remote Forcing. *SOLA*, 8, 65-68, doi: <http://dx.doi.org/10.2151/sola.2012-017>
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単行本(単著及び分担執筆)

1. 気象研究ノート第248号「点発生源からのメソスケール拡散シミュレーション —福島第一原子力発電所事故をふまえて—」近藤裕昭、佐藤陽祐、永井晴康、山澤弘実編集 2023、(分担執筆:岩崎俊樹、近藤裕昭、関山剛; 第11章 不確実性を考慮した大気拡散予測情報の緊急時活用法について)
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