

CHEIN-JUNG SHIU

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Full CV

Education

- Department of Atmospheric Sciences, National Taiwan University, Taipei, Taiwan
PhD (2000/09 –2008/01). Advisor: Jen-Ping Chen
- Institute of Environmental Engineering, National Chung-Hsing University, Taichung, Taiwan
ME (1995/09 –1997/06). Advisor: Man-Ting Cheng
- Department of Environmental Engineering, National Chung-Hsing University, Taichung, Taiwan
BE (1991/09 –1995/06).

Appointments

- Associate research specialist, Research Center for Environmental Changes, Academia Sinica, Taipei, Taiwan (2023/01 – present)

Job description:

- Technical support in the development and maintenance of aerosol-cloud interactions related parameterizations in Taiwan Earth System Model (TaiESM)
 - Technical support in the development and evaluation of the Unified Aerosol-Cloud-Convection-Precipitation (UACCP) parameterization
 - Supporting Anthropogenic Climate Change Center's research on identifying mechanisms and diagnosing environmental impacts associated with climate changes
- Assistant research specialist, Research Center for Environmental Changes, Academia Sinica, Taipei, Taiwan (2012/11 –2023/01)
 - Postdoctoral scholar, Laboratory of Climate Change Research, Consortium for Climate Change Study, Ministry of Science and Technology, Taipei, Taiwan (2012/01 –2012/11)
 - Postdoctoral fellow, Research Center for Environmental Changes, Academia Sinica, Taipei, Taiwan (2008/02 –2012/01)
 - Research associate, Earth System Science Interdisciplinary Center, University of Maryland at College Park, Maryland, USA (2009/11 –2011/10)

- Visitor, Mesoscale Atmospheric Processes Laboratory (in Dr. Wei-Kuo Tao's group), NASA Goddard Space Flight Center, Greenbelt, Maryland, USA (2009/11–2011/10)
- Part-time research assistant and PhD student, Research Center for Environmental Changes, Academia Sinica, Taipei, Taiwan (2000/09–2008/01)
- Research assistant, Environmental Changes Research Project Office, Institute of Earth Science, Academia Sinica, Taipei, Taiwan (1999/07–2000/08)

Other Activities

- **International atmospheric research projects**

Taiwan Earth System Model version 1 (TaiESM1) has been enrolled in the CMIP6. I am responsible for all the Tiers of simulations (with Dr. Wei-Liang Lee) requested by the Cloud Feedback Model Intercomparison Project (CFMIP) phase 3 and served as the corresponding person.

- **Journal and project proposal reviewer**

Journal: Geoscientific Model Development, Climate Dynamics, Journal of Climate, Geophysical Research Letter, Journal of Geophysical Research-Atmosphere, Quarterly Journal of Royal Meteorological Society, International Journal of Climatology, Journal of hydrometeorology, Journal of Atmospheric and Solar-Terrestrial Physics, Theoretical and Applied Climatology, Atmospheric Research, Terrestrial Ocean and Atmosphere, Terrestrial, Atmospheric, and Oceanic Sciences, Advances in Atmospheric Sciences, Atmosphere, Aerosol and Air Quality Research, Journal of Marine Science and Technology, and Environmental Science: Atmospheres

Project proposal: National Science Council, Ministry of science and Technology, and National Science and Technology Council (Taiwan)

Publications (*corresponding author)

~Peer-reviewed Papers~

1. Shiu, C.-J.*, Y.-C. Wang, W.-T. Chen, H.-L. Pan, R. Sun, Y.-H. Chen, H.-H. Hsu, and C.-A. Chen, 2021: GTS v1.0: A macrophysics scheme for climate models based on a probability density function, *Geosci. Model Dev.*, 14, 177–204, <https://doi.org/10.5194/gmd-14-177-2021>.
2. Tsai, I.-C., S.-W. Yang, C.-J. Shiu*, Y.-Y. Chen, Chen-An Chen, W.-L. Lee, and H.-H. Hsu, 2024: Aerosol Impacts on the East Asian Winter Monsoon: Insights from TaiESM1 and CMIP6 Simulations. *International Journal of Climatology*, 44(9), 2816–2832. <https://doi.org/10.1002/joc.8483>
3. Wu, C.-H., S.-Y. Lee, I.-C. Tsai, C.-J. Shiu, and Y.-Y. Chen, 2023: Volcanic

- contribution to the 1990s North Pacific climate shift in winter. *Scientific Reports*, 13: 5672, <https://doi.org/10.1038/s41598-023-32956-z>.
4. Wu, C.-H., C.-J. Shiu, Y.-Y. Chen, I.-C. Tsai, and S.-Y. Lee, 2023: Climatological changes in East Asian winter monsoon circulation in a warmer future. *Atmospheric Research*, 284, <https://doi.org/10.1016/j.atmosres.2022.106593>
 5. Dutta, U., A. Hazra, H. S. Chaudhari, S. K. Saha, S. Pokhrel, C.-J. Shiu, and J.-P. Chen, 2021: Role of microphysics and convective auto-conversion for the better simulation of Tropical Intraseasonal Oscillations (MISO and MJO). *Journal of Advances in Modeling Earth Systems*, <https://doi.org/10.1029/2021MS002540>.
 6. Wang, Y.-C., H.-H. Hsu, C.-A. Chen, W.-L. Tseng, P.-C. Hsu, C.-W. Lin, Y.-L. Chen, L.-C. Jiang, Y.-C. Lee, H.-C. Liang, L. Chang, W.-L. Lee, and C.-J. Shiu, 2021: Performance of the Taiwan Earth System Model in simulating climate variability compared with observations and CMIP6 model simulations. *Journal of Advances in Modeling Earth Systems*, 13, e2020MS002353. <https://doi.org/10.1029/2020MS002353>.
 7. Lee, W.-L., Wang, Y.-C., Shiu, C.-J., Tsai, I., Tu, C.-Y., Lan, Y.-Y., Chen, J.-P., Pan, H.-L., and H.-H. Hsu, 2020: Taiwan Earth System Model Version 1: description and evaluation of mean state, *Geosci. Model Dev.*, 13, 3887–3904, <https://doi.org/10.5194/gmd-13-3887-2020>.
 8. Chou, M.-D., K.-T. Lee, I.-S. Zo, W.-L. Lee, C.-J. Shiu, and J.-B. Jee, 2021: A New k-Distribution Scheme for Clear-Sky Radiative Transfer Calculations in Earth's Atmosphere. Part II: Solar (Shortwave) Heating due to H₂O and CO₂, *Journal of Atmospheric Sciences*, 78, 2657–2675, doi: 10.1175/JAS-D-20-0278.1.
 9. Chou, M.-D., J. C.-C. Yu, W.-L. Lee, C.-J. Shiu, K.-T. Lee, I.-S. Zo, J.-B. Jee, and B.-Y. Kim, 2020: A New k-Distribution Scheme for Clear-Sky Radiative Transfer Calculations in Earth's Atmosphere. Part I: Thermal Infrared (Longwave) Radiation, *Journal of Atmospheric Sciences*, <https://doi.org/10.1175/JAS-D-19-0088.1>.
 10. Wang, X., S. C. Liu, R. Liu, C.-J. Shiu, C. He, and X. Zhong, 2019: Observed changes in precipitation extremes and effects of tropical cyclones in South China during 1955–2013. *Int. J. Climatol.*, 1–8. <https://doi.org/10.1002/joc.5980>.
 11. Chen, P.-Y., Tan, P.-H., Chou, C. C.-K., Lin, Y.-S., Chen, W.-N., C.-J. Shiu, 2019: Impacts of holiday characteristics and number of vacation days on “holiday effect” in Taipei: Implications on ozone control strategies. *Atmos. Environ.*, 202, 357-369.

doi: 10.1016/J.ATMOSENV.2019.01.029.

12. Liu, R., Su, H., Liou, K.-N., Jiang, J. H., Gu, Y., Liu, S. C., and C.-J. Shiu, 2018: An assessment of tropospheric water vapor feedback using radiative kernels. *J. Geophys. Res.: Atmospheres*, 123, 1499–1509. <https://doi.org/10.1002/2017JD027512>.
13. Li, J., R. Liu, S. C. Liu, C.-J. Shiu, J. Wang, and Y. Zhang, 2016: Trends in aerosol optical depth in northern China retrieved from sunshine duration data, *Geophys. Res. Lett.*, 43, 431–439, doi:10.1002/2015GL067111.
14. Liu, R., S. C. Liu, C.-J. Shiu, J. Li, and Y. H. Zhang, 2016: Trends of regional precipitation and their control mechanisms during 1979–2013. *Adv. Atmos. Sci.*, 33 (2), 164–174, doi: 10.1007/s00376-015-5117-4.
15. Liu, R., S. C. Liu, R. J. Cicerone, C.-J. Shiu, J. Li, J. L. Wang, and Y. H. Zhang, 2015: Trends of extreme precipitation in eastern China and their possible causes. *Adv. Atmos. Sci.*, 32 (8), 1027–1037, doi: 10.1007/s00376-015-5002-1.
16. Shiu, C.-J., Shaw Chen Liu, Congbin Fu, Aiguo Dai and Ying Sun, 2012: How Much do Precipitation Extremes Change in a Warming Climate? *Geophys. Res. Lett.*, 39, L17707, doi:10.1029/2012GL052762.
17. Liu, Shaw Chen, Congbin Fu, C.-J. Shiu, Jen-Ping Chen, Futing Wu, 2009: Temperature Dependence of Global Precipitation Extremes, *Geophys. Res. Lett.*, 36, L17702, doi:10.1029/2009GL040218.
18. Shiu, C.-J., S. C. Liu, and J.-P. Chen, 2009: Diurnally asymmetric trends of temperature, humidity and precipitation in Taiwan, *J. Climate*, 22, 5635–5649.
19. Chang, Chih-Chung, Jia-Lin Wang, Shih-Chun Candice Lung, Shaw Chen Liu, C.-J. Shiu, 2009: Source characterization of ozone precursors by complementary approaches of vehicular indicator and principal component analysis. *Atmos. Environ.*, 43, 1771–1778.
20. Liu, Tsun-Hsien, Fujung Tsai, Shih-Chieh Hsu, C.-J. Shiu, Wei-Nei Chen, Jien-Yi Tu, Guan-Ru Chen, Yu-Ling Chuang, 2009: Southeastward Transport of Asian Dust and its Contributions to Northern Taiwan. *Atmos. Environ.*, 43, 458–467.
21. Chou, C. C.-K., C.-Y. Tsai, C.-J. Shiu, S. C. Liu, T. Zhu, 2009: Measurement of NO_y during CAREBEIJING-2006: Implications for the ozone production efficiency of NO_x. *J. Geophys. Res.* 114, Issue D7, CiteID D00G01.
22. Tan, Pei-Hua, Chia Chou, Jing-Yi Liang, Charles C.-K. Chou, C.-J. Shiu, 2009:

Air pollution “holiday effect” resulting from the Chinese New Year. *Atmos. Environ.* 43, 2114–2124.

23. Shiu, C.-J., S. C. Liu, C.-C. Chang, J.-P. Chen, C. C. K. Chou, C.-Y. Lin, and C.-Y. Young, 2007: “Photochemical Production of Ozone and Control Strategy for Southern Taiwan”, *Atmos. Environ.*, 41, 9324–9340.
24. Chou, C. C. K., S. C. Liu, C.-Y. Lin, C.-J. Shiu, and K.-H. Chang, 2006: “The trends of surface ozone in Taipei, Taiwan, and its causes: Implications for ozone control strategies”, *Atmos. Environ.*, 40, 3898–3908.
25. Lin, C.-Y., S. C. Liu, C. C. K. Chou, T. H. Liu, C.-T. Lee, C.-S. Yuan, C.-J. Shiu, and C.-Y. Young, 2004: “Long-Range Transport of Asian Dust and Air Pollutants to Taiwan”, *Terrest. Atmos. Ocean. (TAO)*, 15, 759–784.
26. Liu, S. C., C.-H. Wang, C.-J. Shiu, H.-W. Chang, C.-K. Hsiao and S.-H. Liaw, 2002: “Reduction in Sunshine Duration over Taiwan: Causes and Implications”, *Terrest. Atmos. Ocean. (TAO)*, 13, 523–545.
27. Liu, S. C. and C.-J. Shiu, 2001: “Asian Dust Storms and Their Impact on the Air Quality of Taiwan”, *Aerosol and Air Quality Research*, Vol. 1, No. 1, 1–8.

~**Technical reports**~

1. Shiu, C.-J.*, C.-H. Wu, C.-A. Chen, W.-L. Tseng, C.-W. Cheng, C.-A. Chen, H.-C. Liang, W.-L. Lee, and H.-H. Hsu (2022), Examining climatic impacts of the four fast-physics parameterizations of TaiESM1, Technical Report, RCEC, Academia Sinica.
2. Shiu, C.-J.*, Chao-An Chen, Yi-Hsuan Chen, I-Chun Tsai, Wei-Ting Chen, Jen-Ping Chen, Jui-Lin Frank Li, Yi-Chi Wang, Wei-Liang Lee, and Huang-Hsiung Hsu (2018), Modifying Cloud-Related Physical Parameterizations for TaiESM, Technical Report, RCEC, Academia Sinica.
3. Shiu, C.-J.* (2014), Implementation of a two-moment cloud microphysics parameterization for convective and stratiform clouds of NCAR CESM, Technical Report, RCEC, Academia Sinica.
4. Shiu, C.-J.* (2012), Improving clouds and precipitation simulations in global climate models, Technical Report, RCEC, Academia Sinica.

~**Book/Book Chapter/Dissertation**~

1. Chen, J.-P., A. Hazra, C.-J. Shiu, I-C. Tsai, and H.-H. Lee, (2008): Interaction between Aerosols and Clouds: Current Understanding, In: Recent Progress in

Atmospheric Sciences: Applications to the Asia-Pacific Region. p231-281. Edited by K. N. Liou and M.-D. Chou., Published by World Scientific Publishing Co. Pte. Ltd.

2. Shiu, C.-J. (2008): Radiative Effects of Aerosols on the Environment in Taiwan. Ph.D. Dissertation, 208pp. National Taiwan University (in English)
3. Shiu, C.-J. (1997): The Modeling Development of Atmospheric Particle Dry Deposition in Taichung Area. Master Thesis, 141pp. National Chung-Hsing University (in Chinese)