

Research Achievements (Konduru Rakesh Teja)

A. List of Publications (12)

12. **Konduru, R.T.**, Bale, R., Tsubokura., M., and Miyoshi, T. (2025) Transforming urban wind engineering by taming extreme weather strong winds over urban skylines with ultra-high-resolution simulations on supercomputer Fugaku. (In) Super Computing Asia 2025, Lecture notes. (accepted)
11. Singh, V., Srivastava, A., Gupta, A., Konduru, R.T., et. al., (2024). Intensification mechanisms and moisture dynamics of super-cyclonic storm 'Amphan' over the Bay of Bengal: Implications for aerosol re-distribution. *Science of Total Environment*, 13, 951, 175501.
10. Gupta, A., **Konduru, R. T.**, and Vivek, S. (2023). Satellite sensed summer monsoon torrential rain events characteristics along the Himalayan regions of north India and their dynamics. *Atmospheric Research*, 107077. <https://doi.org/10.1016/j.atmosres.2023.107077>
9. **Konduru, R. T.**, Mrudula, G., Vivek, Singh., Srivastava, A. K., and Abhay, K. S. (2023) Unravelling the causes of 2015 winter extreme rainfall over Chennai: Influence of atmospheric variability and urbanization on the hydrological cycle. *Urban Climate*, 47, 101395. <https://doi.org/10.1016/j.uclim.2022.101395>
8. **Konduru, R. T.**, Matsumoto, J., Yokoi, S., and Mori, S. (2022) Climatological characteristics of nocturnal eastward propagating diurnal precipitation system over southeast India during summer monsoon: Role of mountain-plain-sea circulations and Gravity waves. *Meteorological Applications*, 29 (6).
7. **Konduru, R. T.**, G. M. (2021). Effect of offshore troughs on the South India erratic summer monsoon rainfall in June 2017. *Dynamics of Atmospheres and Oceans*. <https://doi.org/10.1016/j.dynatmoce.2020.101187>
6. Singh, V., **Konduru, R. T.**, Srivastava, A. K., Momin, I. M., Kumar, S., Singh, A. K., ... & Sinha, A. K. (2021). Predicting the rapid intensification and dynamics of pre-monsoon extremely severe cyclonic storm 'Fani' (2019) over the Bay of Bengal in a 12-km global model. *Atmospheric Research*, 247, 105222.
5. **Konduru, R. T.**, Takahashi, H. G. (2020). Effects of convection representation and model resolution on diurnal precipitation cycle over the Indian monsoon region: Toward a convection-permitting regional climate simulation. *Journal of Geophysical Research: Atmospheres*, 125, e2019JD032150.
4. **Konduru, R. T.**, Takahashi, H. G. (2020). Seasonal differences in the land-atmosphere coupling over South Asia simulated using a regional climate model. *Geographical reports of Tokyo Metropolitan University*, 55, 23-34.
3. Long, T. T., **Konduru, R. T.**, Matsumoto, J. et al., (2019): Autumn rainfall increasing trend in South Central Vietnam and its association with changes in Vietnam's East Sea surface temperature, *Geographical reports of Tokyo Metropolitan University*, 54, 11-22.
2. **Konduru, R. T.**, Kishtawal, C. M., and Shah, S. (2013). A new perspective on the infrared brightness temperature distribution of deep convective clouds. *Journal of Earth System Sciences*, 122(5), 1195-1206.

1. **Konduru, R. T.**, (2012). The effect of El Niño and La Niña on the Tropical cyclones of North Indian Ocean. Indian Ocean Tropical Cyclone Conference, New Delhi, RSMC, WMO, WWRP 2013-1.

B. Conference proceedings (1)

1. **Konduru, R.T.**, Bale, R., and Tsubokura., M. (2025) Energy cascading in urban flows under adiabatic and isothermal conditions: Insights from 2-m large eddy simulations. Proceedings of Turbulence, heat and mass transfer 11, Tokyo, Japan. (Under review)

C. Publications under review (4)

4. **Konduru, R.T.**, Bale, R., Tsubokura., M., and Miyoshi, T. (2025). Enabling urban flow and energy cascading over urban skylines through 2-m CFD simulations during weak and strong wind scenarios. Sustainable Cities and Society. (Under Review)

3. **Konduru, R. T.**, Jianyu, L., and Miyoshi, T. (2024) Unlocking the Assimilation of Frequent Satellite Data Assimilation in Enhancing Global Weather Forecasts with Adaptive Observation Error Inflation: Insights from Observation System Simulation Experiments. Journal of Geophysical Research- Atmospheres (Under review)

2. **Konduru, R.T.**, Bale, R., and Gupta, A. (2024). Urbanization-Resolved Scales Amplify Torrential Rainfall in a Coastal Megacity. Geophysical Research Letters (Under Review).

1. **Konduru, R. T.**, et al. (2024) Effect of aerosols in the intensification of winter hailstorms over semi-arid regions of north India. Journal of Hydrometeorology (Under review)

D. Oral Presentations (51)

D1. Invited talks (9)

9. **Konduru, R. T.** (2024) Harnessing Satellite Data Assimilation and Large Eddy Simulations to Unveil Extreme Rainfall Over Urban Skylines. at Science Frontier Geoscience Seminar, School of Science, Osaka Metropolitan University, Osaka on 26th November 2024. (Invited Talk)

8. **Konduru, R. T.** (2024) Unravelling the Urbanization Effects on the Extreme Rainfall Events: Insights from Mesoscale to Large Eddy Model simulations. at Department of Physics, School of Science and Engineering, Ateneo de Manila University, Philippines on 23rd May. (Invited Talk: Online)

7. **Konduru, R. T.** (2023) Seamless predictability of rainfall systems by employing ultra-high resolution computational simulations and their applications. at Department of Civil Engineering, Indian Institute of Technology Madras, Chennai, India on 13th June. (Guest Lecture)

6. **Konduru, R. T.** (2023) Challenges in assimilating high-frequency satellite observations and diagnosing high-frequency errors: Insights from global NICAM-LETKF system. at Space Applications Centre, Indian Space Research Organisation, Ahmedabad, India on 7th June. (Invited seminar)
5. **Konduru, R. T.** (2023) Seamless predictability of rainfall systems by employing ultra-high resolution computational simulations and their applications. at Dep. of Civil Engineering, National Institute of Technology Warangal, India, June.
4. **Konduru, R. T., Jianyu Liang, and Takemasa Miyoshi** (2023) Challenges in the high-frequency microwave satellite radiances assimilation using NICAM-LETKF in the OSSE framework. at a Data assimilation seminar co-hosted by the University of Reading and the RIKEN Center for Computational Science. (Online)
3. **Konduru, R. T.** (2023) Ubiquitous nature of the diurnal cycle of precipitation and its representation in current generation climate models. at an international workshop on the Climate, water, land and life in Monsoon Asia. Hosted by Tokyo Metropolitan University, Tokyo, Japan.
2. **Konduru, R. T.** (2023) How to make high-resolution simulations representative of future climate, at a symposium on Examining the impact of Aerosol, Urbanization, and Irrigation on extreme rainfall occurrences over India using Cloud-Resolving Simulations., at Indian Institute of Technology Madras, India.
1. **Konduru, R. T.** and Jun Matsumoto (2021) Nocturnal Offshore Propagation of precipitation systems over the Asian tropics observed by satellite TRMM precipitation RADAR., at Center for Coupled Ocean-Atmosphere Research JAMSTEC, Yokosuka, Japan.

D2. Conference presentations (26)

26. **Konduru, R. T., and Bale, R.** (2024), Exploring Fundamental Mean and Turbulent Scale Interactions and their Tagging over Urban Atmosphere under extreme and calm weather scenarios using a computational fluid dynamics model. American Geophysical Union Meeting 2024, Washington DC, USA, December 8–13, 2024. (E-lightening, oral)
25. **Konduru, R. T., Liang, J., and Miyoshi, T.** (2024), Adaptive Observation Error Inflation with the Assimilation of High-Frequency Satellite Observations under an OSSE Framework with NICAM-LETKF. The CRC International Summer School 2024, Lindner & Hotels Resorts, Boltenhagen, Germany, September 15–20, 2024. (Oral)
24. **Konduru, R. T., Liang, J., Otsuka, S., and Miyoshi, T.** (2024), Improving Small-scale Tropical Precipitation Forecast by Assimilating Frequent Satellite Microwave Observations. 11th Workshop on the International Precipitation Working Group, Tokyo Institute of Technology, Tokyo, July 15–18, 2024. **(Highly Commendable presentation award)**
23. **Konduru, R. T., Liang, J., and Miyoshi, T.** (2024), Adaptive Observation Error Inflation with the Assimilation of High-Frequency Satellite Observations under an OSSE Framework with NICAM-LETKF. Asia Oceania Geosciences Union 2024 Meeting, Pyeongyang, S.Korea, June 24–June 28, 2024. (Oral)

- 22. Konduru, R. T.,** and Bale, R. (2024), Energy Cascading During Extreme and Calm Weather Scenarios Over Urban Atmosphere: Insights from Cube Computational Fluid Dynamics Model. Asia Oceania Geosciences Union 2024 Meeting, Pyeongyang, S.Korea, June 24–June 28, 2024. (Oral)
- 21. Konduru, R. T.,** Otsuka, S., Liang, J., and Miyoshi, T. (2024), Enhancing Small-Scale Global Weather Forecasting by High-Frequency Satellite Data Assimilation: A Horizontal Localization Aspect. Japan Geosciences Union 2024 Meeting, Chiba, Japan, May 27–March 31, 2024. (Oral)
- 20. Konduru, R. T.,** Otsuka, S., Liang, J., and Miyoshi, T. (2024), Enhancing Small-Scale Global Weather Forecasting by High-Frequency Satellite Data Assimilation: A Horizontal Localization Aspect. Meteorological Society of Japan Spring Meeting, Tokyo, Japan, May 21–March 23, 2024. (Oral; Online)
- 19. Konduru, R. T.,** Liang, J., and Miyoshi, T. (2024), Adaptive Observation Error Inflation with the Assimilation of High-Frequency Satellite Observations under an OSSE Framework with NICAM-LETKF. The First NCU-RIKEN Joint Workshop on Data Assimilation for Severe Weather Prediction, Taipei, Taiwan, February 29–March 01 2024.(Oral)
- 18. Konduru, R. T.,** and Bale, R. (2023) Energy cascading during Typhoon and calm weather scenarios over the Urban atmosphere: Insights from CUBE computational fluids dynamics model. 1st International Workshop on Typhoon Reseach (IWTRC 2023), Yokohama National Univeristy, Yokohama, Japan, November 8–9 2023. (Oral)
- 17. Konduru, R. T.,** Otsuka, S., Liang, J., and Miyoshi, T. (2023) Diagnostic Scale Decomposition of RMSE in Data Assimilation: Insights from OSSEs with NICAM-LETKF., The 6th International Workshop on the Nonhydrostatic Models (NHM-WS-2023), D-3, Hokkaido University, Sapporo, Japan, 31 August–02 September 2023. (Oral)
- 16. Konduru, R. T.,** et al. (2023) Highest annual and seasonal precipitation of Japan observed by the TRMM PR over Yakushima island: Role of surface wind convergence and Kuroshio SST., JpGU General Meeting 2023, Chiba, Japan, 21–26 May 2023, ACG30-09.
- 15. Konduru, R. T.,** Liang, J., and Miyoshi, T. (2023) Observing system simulation experiment of hourly global coverage of satellite microwave radiances using NICAM-LETKF., JpGU General Meeting 2023, Chiba, Japan.
- 14. Gupta, A., Konduru, R. T.,** and Singh, V. (2023) Large-eddy simulation-based representation of Urbanization influence on the 2015 Chennai flood event., VII Convection Permitting Climate Modeling Workshop (CPCM-2023), Bergen, Norway, 29–31 August. (Oral)
- 13. Gupta, A., Singh, V., Srivastava, A. K., Konduru, R. T., Kanawade, V., and Sarangi, C. (2023)** Aerosol induced rare winter hailstorm in a dry region of North India., The 6th International Workshop on the Nonhydrostatic Models (NHM-WS-2023), Hokkaido University, Sapporo, Japan, 31 August–02 September 2023. (Oral)
- 12. Liang, J., Konduru, R. T.,** and Miyoshi, T. (2023) Exploring the Advantages of Assimilating High Temporal Frequency Satellite Microwave Radiances., The 6th International Workshop on the Nonhydrostatic Models (NHM-WS-2023), D-2, Hokkaido University, Sapporo, Japan, 31 August–02 September 2023. (Oral)

11. Miyoshi, T., Ohishi, S., Liang, J., **Konduru, R. T.**, Otsuka, S., Kotsuki, S., Terasaki, K., Okazaki, A., Chen, Y-W, Tomita, H., Kanemaru, K., Satoh, M., Yashiro, H., Okamoto, K., Kalnay, E., Kubota, T., and Kachi, M. (2023), Advances and applications of satellite data assimilation of clouds, precipitation and ocean. American Geophysical Union Annual

Meeting at San Francisco, USA, December 11–15. (Oral)

10. **Konduru, R. T.**, Liang, J., and Miyoshi, T. (2023) High-frequency microwave satellite radiances data assimilation using NICAM-LETKF in the OSSE framework, EGU General Assembly 2023, Vienna, Austria, 24–28 Apr 2023, EGU23-10561. <https://doi.org/10.5194/egusphere-egu23-10561>

9. **Konduru, R. T.**, Jianyu Liang, Koji Terasaki, and Takemasa Miyoshi (2022). Estimating optimal vertical localization in assimilating AMSU-A satellite radiances at different frequencies in the NICAM-LETKF OSSE framework. Annual Meeting of Meteorological Society of Japan, Autumn 2022, Kyoto, Japan. (Oral)

8. **Konduru, R. T.**, Masato, I. Nodzu, and Jun Matsumoto (2022). Satellite observed annual and seasonal variation of Yakushima precipitation. Annual Meeting of the Association of Japanese Geographers, Autumn 2022, Kakegawa, Japan.

7. **Konduru, R. T.**, Hiroshi G. Takahashi, and Jun Matsumoto (2022). Explicit convection regional climate simulation of eastward propagating diurnal precipitation over south India: Role of gravity waves and monsoon low-level circulation. 2022-SPARC Gravity Wave Symposium, online. (Oral)

6. **Konduru, R. T.**, and Hiroshi G. Takahashi (2021). Sensitivity of precipitation intensity and frequency to the land surface resolution in explicit convection climate simulations over South Asian region. The fifth Convection-Permitting Modeling Workshop 2021 (CPM2021; A2-22): High-Resolution Climate Modeling and Hazards. (Oral)

5. **Konduru, R. T.**, and Hiroshi G. Takahashi (2021). Representation of diurnal cycle of summer monsoon precipitation in the convection-permitting climate model and its sensitivity to the current generation cumulus parameterizations. 12th Tropical Meteorology Study Group Meeting, abstracts, 15, Japan.

4. **Konduru, R. T.**, and Hiroshi G. Takahashi, (2018). Continental-scale simulation of the Indian summer monsoon: Model dependency on convection or grid resolution, Abstracts of the 2nd GEWEX (Global Energy and Water Exchange) Convection-Permitting Climate Modelling, National Center for Atmospheric Research, Chapter-6, 52.

3. **Konduru, R. T.**, Vivek Singh, (2017). An observational and modeling study of the August 2017 Florida climate extreme event. Abstracts of American Geophysical Union.

2. **Konduru, R. T.**, (2015). To investigate the climate response of North Atlantic Ocean Dynamics to the CO₂ and CH₄ forcing in NCAR CESM1.2.0 climate model. HOSST symposium, GEOMAR, Kiel, Germany.

1. **Konduru, R. T.**, C M Kishtawal, and Danish Hussain, (2012). Nowcasting of Deep Convective system (Thunderstorm) over SHAR. Workshop on decade celebration: meteorological satellite Kalpana-1 in SAC, ISRO, Ahmedabad, India.

D3. Poster Presentations (16)

- 16. Konduru, R. T.**, Liang, J., Otsuka, S., and Miyoshi, T. (2025), Improving Global Precipitation Forecast by Assimilating Frequent Satellite Microwave Observations. R-CCS Symposium Fugaku, and FugakuNext: Classical, Quantum, and AI, Kobe, January 23–24, 2025. (Poster)
- 15. Konduru, R. T.**, Tandeo, Pierre, and Miyoshi, Takemasa (2024). Credibility Score for uncertainty quantification in the data assimilation and machine learning model predictions: From data to decisions. University of Toyama-RIKEN joint workshop on prediction science, Toyama, Japan.
- 14. Konduru, R. T.**, Liang, J., Otsuka, S., and Miyoshi, T. (2024), Improving Small-scale Tropical Precipitation Forecast by Assimilating Frequent Satellite Microwave Observations. 10th International Symposium on Data Assimilation, Kobe, October 21–25, 2024. (**Best Poster presentation award**)
- 13. Konduru, R. T.**, and Bale, R. (2024), Exploring Urban-Atmosphere Scale Interactions in Extreme Weather from a CUBE computational fluid dynamics model. 9th GEWEX Open Science Conference, Sapporo, Japan, July 7–12, 2024.
- 12.** Miyoshi, T., Ohishi, S., Liang, J., **Konduru, R. T.**, Otsuka, S., Kotsuki, S., Tersasaki, K., Okazaki, A., Tomita, H., Kanemaru, K., Satoh, M., Yashiro, H., Okamoto, K., Kalnay, E., Kubota, T., and Kachi, M. (2024), Advances and applications of satellite data assimilation of clouds, precipitation and ocean. American Meteorological Society 104th Annual Meeting at Baltimore, USA, January 28–February 2, 2024.
- 11. Konduru, R. T.**, Liang, J., and Miyoshi, T. (2024), Adaptive Observation Error Inflation with the assimilation of high-frequency satellite observations under an OSSE framework with NICAM-LETKF. The 6th R-CCS International Symposium Science beyond Fugaku: Classical, Quantum, and AI at Kobe, Japan, January 29–30 2024. (Poster)
- 10.** Miyoshi, T., Ohishi, S., Otsuka, S., Taylor, J., Liang, J., **Konduru, R. T.**, Terasaki, K., Kotsuki, S., Honda, T., Okazaki, A. (2023) Experimental platform for design and evaluation of frequent satellite observations to innovate weather, ocean and land surface prediction. JpGU General Meeting 2023, Chiba, Japan, 21–26 May 2023.
- 9. Konduru, R. T.**, Liang, J., and Miyoshi, T. (2023) Challenges in the assimilation of high-frequency satellite observations using NICAM-LETKF in the OSSE framework, 9th International Symposium on the Data Assimilation (ISDA 2023), University of Bologna, Bologna, Italy, October 16–20 2023. (Poster)
- 8. Konduru, R. T.**, Jianyu Liang, and Takemasa Miyoshi (2023). High-frequency satellite microwave radiances data assimilation using the NICAM-LETKF OSSE framework. The 5th R-CCS International Symposium Fugaku and Beyond: Simulation, BigData, and AI in the Exascale Era, 2023, Kobe, Japan.
- 7. Konduru, R. T.**, Masato, I. Nodzu, and Jun Matsumoto (2022). Satellite observed highest annual precipitation of Yakushima and the role of surface wind convergence. Annual Meeting of Meteorological Society of Japan, Autumn 2022, Kyoto, Japan. (Poster)

- 6. Konduru, R. T.,** and Hiroshi G. Takahashi (2021). On the sensitivity of land-atmosphere coupling to the model mesh sizes during the Indian summer monsoon: Based on high-resolution regional climate simulations. Japan Geoscience Union meeting 2021 (JpGU 2021; A-CG32).
- 5. Konduru, R. T.,** and Hiroshi G. Takahashi (2020). Frequency of noon/afternoon convective precipitation dominates on wet surface conditions over Indian summer monsoon region, Abstracts of Japan Geoscience Union Meeting, AAS10-P15.
- 4. Konduru, R. T.,** and Hiroshi G. Takahashi, (2018). Continental-scale simulation of diurnal variations in south Asia summer monsoon precipitation: Insights from the explicit and parameterized convection experiments, Extended abstracts of 5th International Workshop of Non-hydrostatic Models, Japan Meteorological Agency, Japan, 70-71.
- 3. Konduru, R. T.,** and Hiroshi G. Takahashi (2018). Realistic simulation of Indian summer monsoon rainfall in convection permitting weather research forecasting model, Abstracts of Japan Geoscience Union Meeting, ACG37-P02
- 2. Konduru, R. T.,** Gupta Anu, Jun Matsumoto, and Hiroshi G. Takahashi (2017), On the recent warming in the sub-cloud layer entropy and vertical integrated moist static energy over south Asian monsoon region, Abstracts of American Geophysical Union, A13C-2076.
- 1. Konduru, R. T.,** Gokul Vishnwanathan, and Mrudula G, (2016). Spatio-temporal variations of feedback mechanism between soil moisture leakage and convective rainfall during Indian summer monsoon National Symposium on Tropical Meteorology: Climate Change and Coastal Vulnerability,DOI: [10.13140/RG.2.2.20245.01769](https://doi.org/10.13140/RG.2.2.20245.01769)