

## **Dr. Huang-Hsiung Hsu (HHH 許冕雄)**

Distinguished Research Fellow

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### **EDUCATION**

Ph.D., 1986: Atmospheric Sciences, University of Washington, Seattle, USA

B.S., 1978: Atmospheric Sciences, National Taiwan University, Taipei, Taiwan

### **EMPLOYMENT**

2017/09– present: Distinguished Research Fellow, Research Center for Environmental Change,  
Academia Sinica

2011/08–2017/08: Research Fellow, Research Center for Environmental Change, Academia Sinica

1992/08–2011/07: Professor, Department of Atmospheric Sciences, National Taiwan University

1989/02–1997/07: Associate Professor, Department of Atmospheric Sciences, National Taiwan  
University

1987/12–1989/01: Post-doctoral Research Fellow, Department of Meteorology, University of  
Reading, UK

### **HONORS & AWARDS**

2018 Annual Research Highlight, RCEC, Academia Sinica

2017 Annual Research Highlight, RCEC, Academia Sinica

2015 Annual Research Highlight, RCEC, Academia Sinica

2014 Fellow, ROC Meteorological Society

### **ACADEMIC SERVICE & RESEARCH PROJECTS**

#### **Professional positions (selected):**

*Chief Executive Officer, Anthropogenic Climate Change Research Center/RCEC (2021/1–present)*

*Deputy Director, Research Center for Environmental Changes, Academia Sinica (2013/1–2020/12)*

*Chairman, Department of Atmospheric Sciences, National Taiwan University (2002/8–2005/7)*

*Member, Modeling and Prediction Group, Asian Monsoon Year, CLIVAR*

*Member, TAO Array Implementation Panel, 1998–2000*

*Member, Expert Team on Climate Impacts on Monsoon Weather World Weather Research Program  
Monsoon Panel, WMO, 2007–2011*

*Leader, Taiwan's participation in Driftsonde program of THORPEX (2008)*

*Leader, Taiwan's participation in TOGA/COARE (1992/93)*

*Co-PI, AMIP diagnostics subproject "GCM Simulation of East Asian Climate" (1994–present);  
co-chair (2008–present)*

*Member, Executive Steering Committee, FORMOSAT-7/COSMIC-2 program*

*Member, Disaster Prevention and Protection Expert Consultation Committee (2011–2012,  
2018–2021)*

*Member, several Taiwan national committees (IGBP, IHDP, IUGG, IAMAS), National Center for*

*High-performance Computing, National Space Organization*  
*Coordinator, Atmospheric Science Program, National Science Council*  
*Member, Advisory Panel for Atmospheric Science Program, National Science Council and Ministry of Science and Technology*  
*Coordinator, “Data Bank for Atmospheric Research” (formerly “Subtropical Meteorological Data Bank”), a service project sponsored by the National Science Council, 1990-2008*  
*PI of two national core projects in climate change: Taiwan Climate Change and Information Platform, and Consortium for Climate Change Study*  
*Leader, Development of Taiwan Earth System Model (TaiESM) and Taiwan’s participation in CMIP6*

**Journal and project proposal reviewer:**

*Journal: Bulletin of the American Meteorological Society, Monthly Weather Review, Journal of Atmospheric Sciences, Journal of Climate, Geophysical Research Letter, Journal of Geophysical Research (Atmosphere), Quarterly Journal of Royal Meteorological Society, International Journal of Climatology, Journal of Meteorological Society of Japan, SOLA, Theoretical and Applied Climatology, Atmosphere-Ocean, Advances in Atmospheric Sciences, Atmospheric Chemistry and Physics, Atmospheric Science Letter, Terrestrial Ocean and Atmosphere, Atmospheric Sciences (in Chinese)*  
*Project proposal: National Science Council and the Ministry of science and Technology (Taiwan), National Science Foundation (USA), Research Grants Council (Hong Kong), German Federal Ministry of Education and Research, Swiss National Science Foundation*

**Editorial board:**

*Editor, Scientific On-line Letters on Atmosphere, the Meteorological Society of Japan, 2012–present*  
*Editor, Asia-Pacific Journal of Atmospheric Sciences, Springer, 2012–2015*  
*Associate Editor, Monthly Weather review, 2011*  
*Executive Editor, Recent Progress in Atmospheric Sciences-Applications to the Asia-Pacific Region, World Scientific, 2008*  
*Chief Editor: Scientific Report on Typhoon Morakot (2009), Climate Change in Taiwan: Scientific Report 2011, and Climate Change in Taiwan: Scientific Report 2017 (all in Chinese)*

**Professional societies and organizations:**

*American Meteorological Society, American Geophysical Union, ROC Meteorological Society, ROC Geophysical Union, Asia Oceania Geosciences Society*

**Teaching:**

*Courses: “Climatology”, “Global Atmospheric Circulation”, “Atmospheric Wave Dynamics”, “Large Scale Dynamical Processes”, “Weather and Climate”, “Introduction to Global Change”, “ENSO”, “Introduction to the Earth System Science”, “Climate Diagnostics”, “Selected Reading of Popular Atmospheric Science Publication” in NTU; “Atmospheric Dynamics” in TIGP, Academia Sinica;*  
*Supervised graduate students: 10 PhD. and 42 MS. Students in NTU; 2 PhD students in Academia Sinica*

**Community climate data service:**

In the early 1990s, long-term climate data especially the global analyses could not be easily accessed in Taiwan. HHH assumed the responsibility of managing the Data Bank for Atmospheric Research for collecting and archiving long-term local and global atmospheric and oceanic data and disseminating the data to research community in Taiwan. He committed to the service for about 15 years. He also initiated the data rescue effort in Taiwan to digitize the historical meteorological data on paper dated back to 1895. The effort that was later continued by the Central Weather Bureau have digitized several tens millions of hand-written observation records since then.

### **National scientific reports:**

HHH was the key person in initiating and organizing three national scientific reports (all in Chinese) sponsored by the National Science Council (later reorganized as the Ministry of Science and Technology) in Taiwan: 1. *Scientific Report of Typhoon Morakot*, and 2. *Climate Changes in Taiwan: Scientific Report 2011 and 2017*. These reports provided important scientific bases for research planning and policy-making in climate change adaptation. He has been the key person in Taiwan to lead the climate change-related research in Taiwan since the late 2000s.

### **International atmospheric and oceanic field campaigns and research projects:**

HHH planned and led Taiwan's participation in the atmospheric and oceanic field campaigns during TOGA/COARE (1992-1993), TOGA/TAO (1992-2000), and the THORPEX/Driftsonde campaign in WCRP/WWRP THORPEX-YOTC (2008). HHH is now the leader of Taiwan's participation in CMIP6. HHH was a co-founder of the international research project 'East Asian Climate' in 1994 and has been a co-leader in organizing international workshops since then.

### **RESEARCH INTERESTS**

Atmosphere-Ocean Teleconnection, Intraseasonal Oscillation, ENSO, Asian Monsoon, Subseasonal Multiscale Interaction, Decadal-Interdecadal Variation, Climate Change

### **RESEARCH HIGHLIGHTS**

- **Teleconnection:** HHH has been continuing his research on teleconnection since his PhD work and expanded the scope from atmospheric to atmosphere-ocean coupled teleconnection. He identified the clockwise propagation of near-surface teleconnection pattern around the mountain ranges in the Northern Hemisphere and interpreted the phenomena as the topographic Rossby wave. He was the first to conduct the global teleconnectivity study using streamfunction and documented interhemispheric teleconnection, the Rossby-wave like energy propagation in the waveguide along the jet streams, and the interhemispheric propagation of wave activity through the equatorial westerly ducts. In the investigation of the Pacific-Japan pattern, they identified the upstream precursors originating from the Eurasian continent, in addition to the traditional tropical-origin concept that had prevailed since the finding of the pattern, and contributed to the understanding of the pattern as an intrinsic mode. HHH and collaborators identified the enhanced triggering effect of the tropical Atlantic sea surface temperature anomaly on the western North Pacific-northern Indian Ocean (atmosphere-ocean) coupled mode, a dominant pattern affecting the interannual variability of the East Asian summer monsoon. They also identified new teleconnection patterns such as the South Pacific Decadal Oscillation and the Eurasian-Pacific Multidecadal Oscillation.
- **Madden-Julian Oscillation:** HHH and collaborators have studied the MJO/ISO since the late 1980s. They were the first to suggest the extratropical forcing of the MJO, which has recently been revisited and emphasized 20 years later by several studies in the MJO community. Proper simulation of MJO in climate models has been and continues to be a great challenge for general circulation models. HHH and collaborators made a breakthrough in early 2010s by demonstrating that coupling a high-resolution one-column ocean mixed-layer model (named SIT) to the atmospheric general circulation model (AGCM) ECHAM5 dramatically improves the simulation of the MJO to have realistic strength, period, and propagation speed. The ECHAM5-SIT was identified as one of few top models in MJO simulation in a model intercomparison study conducted by the WCRP-WWRP YOTC MJO Task Force / GEWEX GASS MJO Global Model Evaluation Project. HHH and collaborators further coupled the same ocean model to several other AGCMs and found the similar improvement. Better resolving the fine structure of upper ocean temperature, especially the warm layer, produces more vigorous

atmosphere-ocean interaction and strengthens intraseasonal variations in both SST and atmospheric circulation. HHH was one of the first few researchers to systematically investigate the orographic effect of the Maritime Continent (MC) on the MJO, which is an important mechanism having been largely neglected in the MJO research and recently receiving more attention because of the Year of Maritime Continent field campaign. In addition to empirical diagnostics, HHH and collaborators conducted a series of numerical experiments with realistic topography, without orography, and with oceans only in the MC region and successfully demonstrated the significant local and remote effects of the orography and land–sea contrast in the MC on the MJO. They recently identified the effect of the MJO westerly anomalies on driving eastward currents, which transported riverine eastward to the nutrition-poor seas encircled by the MC and enriched the phytoplankton activity.

- **Multiscale Interaction in the Western North Pacific:** HHH and collaborators explored the multiscale interaction between tropical cyclone (TC), submonthly perturbation, and intraseasonal oscillation in the western North Pacific (WNP) during the boreal summer. They proposed mechanisms explaining the northwestern propagation of the ISO in the WNP. TCs were found to enhance the amplitude of wave-like perturbation in the WNP, indicating the importance of the two-way interaction in driving the climate variability in the WNP. HHH and collaborators found that the existence of TCs significantly enhanced the monsoon trough and weakened the subtropical high in the WNP, and amplified the intraseasonal–interannual climate variability by 40–60 percent. This finding suggests that TC is a part of climate system and should be considered as an integral component to understand climate variability and climate change. Similarly, a climate model needs to properly resolve TC activity to reliably simulate climate variability and project changes. HHH was invited to write three review articles because of these works.
- **Weather and climate extremes:** HHH and collaborators conducted a series of studies on record-breaking extreme events and found: 1) similar anomalous weather and climate events (but with milder amplitudes) could be induced by different factors, and 2) similar events with extreme amplitude occurred when several of these factors constructively synchronized. They proposed that the compound effect of various influencing factors caused the weather and climate extremes. Each seemingly random event might be caused by different combination of various factors. This randomness is seemingly the reason for the low predictability of the extremes and why statistical study such as composite or correlation analysis often failed to explain the extremes. An increase in the probability of synchronization would increase the occurrence probability of weather and climate extremes. Whether the global warming trend would provide such an environment favorable for synchronization is an intriguing and pressing issue that needs to be seriously considered. An investigation of this issue is needed for a more reliable projection of extreme weather and climate.
- **Climate model development:** In view of the lack of climate modeling capability in Taiwan, HHH organized an effort at climate model development in 2011 under the support of the MOST to nurture local talents in climate modeling and develop/implement climate models for the use in Taiwan. Since 2011, a climate modeling team has been established with the ability in modifying the existing climate models and implementing new modules developed locally. This effort has led to the implementation of Taiwan Earth System Model (TaiESM) developed locally and the High-resolution Atmospheric Model (GFDL) developed by the GFDL. Research community in Taiwan is now participating in CMIP6 using both models and contributes to the climate change projection, as well as for the better understanding and improvement in climate modeling. The HiRAM has been used to conduct several tens of long-term high-resolution (25 and 50 km) climate projections that resolve the future changes in tropical cyclone and other high-impact weathers. The simulation results have been provided to Taiwan’s research

community for further dynamic downscaling to project climatic impact on Taiwan's extreme weather/climate and environment under the warming scenarios and provide useful information for policy making in climate change adaptation.

- **Climate change projection under RCP emission scenarios:** Using the high-resolution projection data from the HiRAM and MRI-AGCM (including d4PDF data) and also coarser-resolution CMIP5/6 models (including TaiESM) to conduct a series of climate change studies with the focus on East Asian monsoon and climate systems (e.g., front, drought, atmospheric river) that affect Taiwan.

## **PUBLICATIONS** (\*corresponding author, #senior author guiding study and writing)

### **Manuscripts (in preparation/to be submitted):**

1. Hong, C.-C., A.-Y. Huang, H.-H. Hsu\*, W.-L. Tseng, M.-M. Lu, C.-C. Chang, 2022: Linkage between record Pakistan flooding and severe China heatwave in boreal summer 2022. To be submitted.
2. Shiu, C.-J., H.-H. Hsu, W.-L. Tseng, Y.-H. Chen, I-C. Tsai, and J.-P. Chen, 2022: Does Cumulus Parameterization with Convective Microphysics Affect Simulations of the Madden-Julian Oscillation? To be submitted to *Climate Dynamics*.
3. Shiu, C.-J., Y.-H. Chen, J.-P. Chen, I-C. Tsai, W.-T. Chen, and H.-H. Hsu, 2022: Implementation of a two-moment warm-cloud and rain microphysics parameterization for convective clouds in a global climate model: Methodology and simulation results. To be submitted to *J. Geophys. Res.-Atmosphere*.

### **Manuscripts (under review):**

1. Tseng, W.-L., Y.-C. Lee, Y.-C. Wang, H.-H. Hsu, and N. Keenlyside, 2022: The characteristics of newly found Atlantic symmetric pattern in austral summer: Interhemispheric teleconnection by seasonal forcing of the southern hemisphere. Submitted to *npj Climate and Atmospheric Science*.
2. Huang, A.-Y., C.-An. Chen, H.-H. Hsu, W.-L. Tseng, P.-C. Hsu, M.-H. Lo, 2022: Increasing Effect of the Warming Trend on Extreme Mei-Yu Rainfall in East Asia: Evidence Based on Two Extremes in 1998 and 2020. Submitted to *Weather and Climate Extremes*.
3. Tsai, I.-C., C.-J. Shiu, W.-C. Wang, C.-A. Chen, and H.-H. Hsu, 2022: Causes for biases in cloud diurnal variation in global climate model. Submitted to *J. Advances in Modeling Earth Systems*.
4. Ko, K.-C., H.-H. Hsu, and J.-H. Liu, 2022: Impact of subtropical ISO propagation routes on Summertime Submonthly Wave Patterns and Tropical Cyclone Activity in the Western North Pacific. Submitted to *J. Climate*.
5. Hsiao, L.-P., and H.-H. Hsu\*, 2022: A revised tropical cyclone genesis potential index for tropical cyclone projection in the western North Pacific. Submitted to *J. Climate*.
6. Hong, H.-J., and H.-H. Hsu\*, 2022: Remote Tropical Influence on Triggering the Marine Heatwave Mode over the Northeast Pacific. Submitted to *Environmental Research Letter*.
7. Yang, S.-W., I-C. Tsai\*, C.-J. Shiu, Y.-Y. Chen, W.-L. Lee, and H.-H. Hsu, 2022: Impacts of Aerosols on the East Asia Winter Monsoon in TaiESM1. Submitted to *Climate Dynamics*.

### **Peer-reviewed papers:**

1. Coauthor in Future Earth, The Earth League, WCRP, 2022: 10 New insights in climate Science 2022, Stockholm, 48pp, <https://zenodo.org/record/7228926#.Y2Mf4-RBzz4>.
2. Martin, M., E. Boakye, E. Boyd, ..., H.-H. Hsu, ..., 2022: 10 New insights in climate Science 2022. Accepted by Global Sustainability.

3. Lee, C.-C., S.-Y. Kuo, H.-H. Hsu, T.-L. Mo, E.-Y. Chang, K.-C. Huang, 2022: How does the research community contribute to corporate climate-related risk disclosures? The gap between ideals and reality. *Corporate Social Responsibility and Environmental Management*, DOI:[10.1002/csr.2397](https://doi.org/10.1002/csr.2397).
4. Pariyar, S. K., N. Keenlyside, W.-L. Tseng, H.-H. Hsu, B.-J. Tsuang, 2022: The role of air–sea coupling on November–April intraseasonal rainfall variability over the South Pacific. *Climate Dynamics*, <https://doi.org/10.1007/s00382-022-06354-6>.
5. Hsu, P.-C., H.-H. Hsu<sup>\*</sup>, H.-J. Hong, Y.-T. Chen, Y.-L. Chen, and W.-L. Tseng, 2022: 2021 Texas Cold Snap: Manifestation of Natural Variability and Recent Warming Trend. *Weather and Climate Extremes*, 37, 100476, <https://doi.org/10.1016/j.wace.2022.100476>.
6. Tseng, W.-L., H.-H. Hsu<sup>\*</sup>, Y.-Y. Lan, C.-Y. Tu, P.-H. Kuo, B.-J. Tsuang, H.-C. Liang, 2022: Improving Madden–Julian Oscillation Simulation in Atmospheric General Circulation Models by Coupling with Snow–Ice–Thermocline One-dimensional Ocean Model. *Geosci. Model Dev.*, 15, 5529–5546, <https://doi.org/10.5194/gmd-15-5529-2022>.
7. Tsai, I.-C., P.-R. Hsieh, C.-T. Cheng, Y.-S. Tung, L.-Y. Lin, H.-H. Hsu, 2022: Impacts of 2 and 4 °C global warmings on extreme temperatures under different land-use types in Taiwan. *Int. J. Climatology*, 1-18, <https://doi.org/10.1002/joc.7815>.
8. Lan, Y.-Y., H.-H. Hsu<sup>\*</sup>, B.-J. Tsuang, C.-Y. Tu, W.-L. Tseng, L.-C. Jiang, 2022: Embedding a one-column ocean model in CAM5 for improving the simulation of boreal winter Madden–Julian oscillation. *Geosci. Model Dev.*, 15, 5689–5712, <https://doi.org/10.5194/gmd-15-5689-2022>.
9. Li, Y.-X., J. D. Neelin, Y.-H. Kuo, H.-H. Hsu, and J.-Y. Yu, 2022: How Close Are Leading Tropical Tropospheric Temperature Perturbations to Those under Convective Quasi-Equilibrium? *J. Atmos. Sci.*, <https://doi.org/10.1175/JAS-D-21-0315.1>.
10. Mehmood, S., M. Ashfaq, S. Kapnick, S. Gosh, M. A. Abid, F. Kucharski, F. Batibeniz, A. Saha, K. Evans., H.-H. Hsu, 2022: Dominant controls of cold season precipitation variability over the high mountains of Asia. *npj Clim Atmos Sci* 5, 65, <https://doi.org/10.1038/s41612-022-00282-2>.
11. Ko, K.-C., H.-H. Hsu<sup>#</sup>, J.-H. Liu, 2022: Impact of global warming on Summertime Submonthly Wave Patterns and Tropical Cyclone Activity in the Western North Pacific. *Clim. Dyn.*, 59, 3535–3554, <http://dx.doi.org/10.1007/s00382-022-06281-6>.
12. Chen, C.-A., and H.-H. Hsu<sup>#</sup>, 2022: Future Change in Extreme Precipitation in East Asian Spring and Mei-yu Seasons in Two High-Resolution AGCMs. *Weather and Climate Extremes*, 35, 100408, <https://doi.org/10.1016/j.wace.2022.100408>.
13. Martin, M., O. Sendra, A. Bastos, N. Bauer, C. Bertram, T. Blenckner, ..., H.-H. Hsu, ... J. Woodcock, 2021: Ten new insights in climate science 2021 – a horizon scan. *Global Sustainability*, 4, 1-20, <https://doi.org/10.1017/sus.2021.25>.
14. Wang, Y.-C., W.-L. Tseng, and H.-H. Hsu, 2021: Role of convection–circulation coupling in the propagation mechanism of the Madden–Julian Oscillation over the Maritime Continent in a climate model. *Clim. Dyn.* 58, pages 2469–2484, <https://doi.org/10.1007/s00382-021-06013-2>.
15. Wang, Y. C., H.-H. Hsu<sup>\*</sup>, C.-A. Chen, W.-L. Tseng, P.-C. Hsu, C.-W. Lin, Y.-L. Chen, L.-C. Jiang, Y.-C. Lee, H.-C. Liang, and W.-M. Chang, W.-L. and Lee, C.-J. Shiu, 2021: Performance of the Taiwan Earth System Model in Simulating Climate Variability Compared With Observations and CMIP6 Model Simulations. *J. Advances in Modeling Earth Systems*, 13, 7, 1-28, <https://doi.org/10.1029/2020MS002353>.
16. Arakane, S., and H.-H. Hsu<sup>#</sup>, 2021: Tropical Cyclone Footprints in Long-Term Mean State and Multiscale Climate Variability in the Western North Pacific as Seen in the JRA-55 Reanalysis. *J. Climate*, 34, 18, 7443-7460, <https://doi.org/10.1175/JCLI-D-20-0887.1>.
17. Hong, C.-C., W.-L. Tseng, H.-H. Hsu<sup>\*</sup>, M.-Y. Lee, and C.-C. Chang, 2021: Relative Contribution of Trend and Interannually Varying SST Anomalies to the 2018 Heat Waves in the

- Extratropical Northern Hemisphere. *J. Climate*, **34**,15, 6319–6333, <http://dx.doi.org/10.1175/jcli-d-20-0556.1>.
18. Henny, L., C. D. Thorncroft, H.-H. Hsu, L. F. Bosart, 2021: Extreme Rainfall in Taiwan: Seasonal Statistics and Trends. *J. Climate*, **34**,12, 4711-4731, DOI: <https://doi.org/10.1175/JCLI-D-20-0999.1>.
  19. Hsu, P.-C., K.-C. Chen, C.-H. Tsou, C.-C. Hong, H.-C. Liang, H.-H. Hsu, C.-Y. Tu, and A. Kitoh, 2021: Future Changes in the Frequency and Destructiveness of Landfalling Tropical Cyclones Over East Asia Projected by High-Resolution AGCMs. *Earth's Future*, **9**, 3, 1-20, <https://doi.org/10.1029/2020EF001888>.
  20. Darmawan, Y., H.-H. Hsu<sup>#</sup>, and J.-Y. Yu, 2021: Characteristics of Large-Scale Circulation Affecting the Inter-Annual Precipitation Variability in Northern Sumatra Island during Boreal Summer. *Atmosphere*, **12**,2, 136; <https://doi.org/10.3390/atmos12020136>.
  21. Wang, C.-C., H.-H. Hsu<sup>#</sup>, and Y.-T. Chen, 2021: Observed and projected frontal activities in East Asia. *J. Climate*, **34**, 8, 3067-3085. <https://doi.org/10.1175/JCLI-D-19-0959.1>.
  22. Chen, C.-A., and H.-H. Hsu<sup>#</sup>, 2021: Evaluation and comparison of CMIP6 and CMIP5 model performance in simulating the seasonal extreme precipitation in the Western North Pacific and East Asia. *Weather and Climate Extremes*,**31**,100303, <https://doi.org/10.1016/j.wace.2021.100303>.
  23. Shiu, C.-J., Y.-C. Wang, H.-H. Hsu, W.-T. Chen, H.-L. Pan, R. Sun, Y.-H. Chen, 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>.
  24. Chen, G., W.-C. Wang, C.-T. Cheng, and H.-H. Hsu, 2021: Extreme Snow Events along the Coast of the Northeast United States: Potential Changes due to Global Warming. *J. Climate*, **34**, 6, 2337-2353, <http://dx.doi.org/10.1175/jcli-d-20-0197.1>.
  25. Hong , C.-C., C.-H. Tsou, P.-C. Hsu, K.-C. Chen, H.-H. Hsu, C.-Y. Tu, S.-J. Lin, and A. Kitoh, 2021: Future Changes in Tropical Cyclone Intensity and Frequency over the Western North Pacific Based on 20-km HiRAM and MRI Models. *J. Climate*, **34**, 6, 2235-2251, <http://dx.doi.org/10.1175/jcli-d-20-0417.1>.
  26. Tseng, W.-L., C.-C. Hong, M.-Y. Le, H.-H. Hsu\*, and C.-C. Chang, 2020: Compound Effect of Local and Remote Sea Surface Temperatures on the Unusual 2018 Western North Pacific Summer Monsoon. *J. Meteor. Soc. Japan*, **98**, 6, 1369-1385, <http://dx.doi.org/10.2151/jmsj.2020-071>.
  27. Teng, H.-F., J. Done, C.-S. Lee, H.-H. Hsu, and Y.-H. Kuo, 2020: Large-Scale Environmental Influences on Tropical Cyclone Formation Processes and Development Time. *J. Climate*, **33**,22, 9763-9782, <https://doi.org/10.1175/JCLI-D-19-0709.1>.
  28. Lin, Y.-L., W. Agyakwa, Justin G. Riley, H.-H. Hsu, and L.-C. Jiang, 2020: Orographic Effects on the Propagation and Rainfall Modification Associated with the 2007-08 Madden-Julian Oscillation (MJO) Past the New Guinea Highlands. *Meteorol Atmos Phys*, doi:<https://doi.org/10.1007/s00703-020-00753-2>
  29. Lee, W.-L., Y.-C. Wang, C.-J. Shiu, I-chun Tsai, C.-Y. Tu, Y.-Y. Lan, J.-P. Chen, H.-L. Pan, and H.-H. Hsu, 2020: Taiwan Earth System Model: Description and Evaluation of Mean State. *Geoscientific Model Development*, **13**, 9, 3887-3904, <https://doi.org/10.5194/gmd-13-3887-2020>.
  30. Li, J.-L. F., W.-L. Lee, K.-M. Xu, J. H. Jiang, E. Fetzer, C.-A. Chen, Y.-H. Wang, J.-Y. Yu, P.-C. Hsu, H.-H. Hsu, 2020: The Role of Falling Ice Radiative effects on Climate Projections over Arctic under Global Warming. *Terr. Atmos. Ocean. Sci.*, **31**, 6, 633-648, DOI: [10.3319/TAO.2020.04.29.01](https://doi.org/10.3319/TAO.2020.04.29.01)
  31. Ko, K.-C., H.-H. Hsu, and J.-H. Liu, 2020: Interdecadal changes of the ISO and the associated TC/submonthly Wave Pattern in the Western North Pacific. *Terr. Atmos. Ocean. Sci.*, **31**, 3, 295-311, <http://dx.doi.org/10.3319/tao.2019.08.20.01>.

32. Hsu, H.-H.\*, and Y.-T. Chen, 2020: Simulation and Projection of Circulations Associated with Atmospheric Rivers along the North American Northeast Coast. *J. Climate*, **33**, 13, 5673–5695, <http://dx.doi.org/10.1175/jcli-d-19-0104.1>.
33. Arakane, S., and H.-H. Hsu<sup>#</sup>, 2020: A Tropical Cyclone Removal Technique Based on Potential Vorticity Inversion to Better Quantify TC contribution to the background Circulation. *Climate Dynamics*, **54**, 5-6, 3201-3226, <http://dx.doi.org/10.1007/s00382-020-05165-x>.
34. Huang, W.-R., P.-H. Huang, Y.-H. Chang, C.-T. Cheng, H.-H. Hsu, C.-Y. Tu, and A. Kitoh, 2019: Dynamical Downscaling Simulation and Future Projection of Extreme Precipitation Activities in Taiwan during the Mei-Yu Seasons. *J. Meteor. Soc. Japan*, **97**, 481–499, doi:10.2151/jmsj.2019-028.
35. Tseng, W.-L., S.-Y. S. Wang, H.-H. Hsu, and J. D. D. Meyer, 2019: Intensification of the decadal activity in Equatorial Rossby Waves and linkage to changing tropical circulation. *Terr. Atmos. Ocean. Sci.*, **30**, 1-11, doi:10.3319/TAO.2019.01.18.02.
36. Lee, W.-L., K.-N. Liao, Y. Gu, C.-C. Wang, H.-H. Hsu, and J.-L. Li, 2019: Impact of 3-D Radiation-Topography Interactions on Surface Temperature and Energy Budget over the Tibetan Plateau in Winter. *J. Geophys. Res. Atmos.*, **124**, 1537–1549. <https://doi.org/10.1029/2018JD029592>.
37. Chang, C. J., H.-H. Hsu\*, W. Cheah, W.-L. Tseng, and L.-C. Jiang, 2019: Madden–Julian Oscillation Enhances Phytoplankton Biomass in the Maritime Continent. *Sci. Rep.*, **9**, 5421, doi:10.1038/s41598-019-41889-5.
38. Teng, H.-F., C.-S. Lee, H.-H. Hsu, J. Done, and G. Holland, 2019: Environmental Conditions Associated with Tropical Cloud Cluster Formation. *J. Climate*, **32**, 4069–4088. <https://doi.org/10.1175/JCLI-D-18-0679.1>.
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  13. 臺灣深度減碳政策建議書中央研究院報告 No. 15 108 年 6 月(Academia Sinica Report No.15: Taiwan Deep Decarbonization Policy Recommendation, June 2019; HHH as a co-author)
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  15. 周佳、李明安、許晃雄(HHH)、洪志誠、盧孟明、陳正達等，2018: 臺灣氣候變遷科學報告 2017 第一冊 物理現象與機制 (Climate Change in Taiwan: Scientific Report 2017)，666 頁(pp)。(HHH as a chapter author and the chief editor)
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### *Conference Proceedings*

1. Hsu, H.-H., and Y.-T. Chen, 2019: Simulation and Projection of Atmospheric River Activity and Circulation along the North American Northeast Coast using GFDL HiRAM. 2019 Fourth Annual US-Taiwan PIRE Workshop, 5–6 August, Sun Moon Lake, Nantou, Taiwan.
2. Hsu, H.-H., and Y.-T. Chen, 2019: Simulation and Projection of Atmospheric River Activity and Circulation along the North American Northeast Coast using GFDL HiRAM. AOGS, 29 July–2 August, 2019, Singapore.
3. Hsu, H.-H., and S. Arakane, 2019: Remote Triggering Effect of a Tropical Cyclone in the Bay of Bengal on a Heavy Rainfall Event in Subtropical East Asia. AOGS, 29 July–2 August, 2019, Singapore. (invited)
4. Hsu, H.-H., and S. Arakane, 2019: Footprints of tropical cyclone in climate variability. IUGG, 8–18 July, 2019, Montreal, Canada.
5. Hsu, H.-H., and S. Arakane, 2019: Remote Triggering Effect of a Tropical Cyclone in the Bay of Bengal on a Heavy Rainfall Event in Subtropical East Asia. IUGG, 8–18 July, 2019, Montreal, Canada.
6. Hsu, H.-H., W.-L. Tseng, C.-Y. Tu, and Y.-Y. Lan, 2019: Coupling a High-resolution Oceanic Mixed Layer Model to AGCMs Improves the Madden-Julian Oscillation Simulation. APCC 2019 International Workshop on Climate Prediction: Past, Present, and Future, 3–4 June, 2019, Taipei, Taiwan. (invited)
7. Hsu, H.-H., W.-L. Tseng, C.-Y. Tu, and Y.-Y. Lan, 2019: Coupling a High-resolution Oceanic Mixed Layer Model to AGCMs Improves the Madden-Julian Oscillation Simulation. KIAPS 2019 International Workshop on Next-Generation NWP Models, 22–24 May, 2019, Jeju, Korea. (invited)
8. Hsu, H.-H., 2019: Reduced TC Activity and Enhanced Anticyclone in the WNP in a Warmer World: Projection and Mechanism. 2019 Conference on Pan-Pacific Anthropocene, 14–16 May, Taipei, Taiwan.
9. Hsu, H.-H., and S. Arakane, 2019: Remote Triggering Effect of a Tropical Cyclone in the Bay of Bengal on a Heavy Rainfall Event in Subtropical East Asia. The 14th 'General Circulation Model Simulations of the East Asian Climate' (EAC) workshop, 27-29 April, 2019, Hong Kong. (meeting coordinator)
10. Hsu, H.-H., 2019: From Cross-scale Climate Modeling to Unified Climate-Weather Modeling. Atmospheric Sciences Annual Meeting, 15–16 February, 2019, Chungli, Taiwan. (keynote)
11. Hsu, H.-H., 2018: Climate change impacts on natural disasters in Taiwan. 2018 International Workshop on Disaster Prevention and Mitigation Technology for Large-Scale Landslides. Taipei, 11 October, 2018. (invited)
12. Hsu, H.-H., 2018: Circulation during high PM2.5 events in Taiwan and changes in stagnation index in East Asia. 2018 Deep Decarbonization Pathway Project workshop, 29 August, 2018, Taipei.
13. Hsu, H.-H., 2018: Future Change in Spring Drought and its Impact on Water Resource in Taiwan. Asia Oceania Geosciences Society 15th Annual Meeting, Honolulu, Hawaii, June 3-8, 2018.
14. Hsu, H.-H., 2018: Simulation and Projection of Atmospheric River Activities Using a High-Resolution AGCM. Asia Oceania Geosciences Society 15th Annual Meeting, Honolulu, Hawaii, June 3-8, 2018. (Session Chairman)
15. Hsu, H.-H., 2018: Reduced TC Activity and Enhanced Anticyclone in the WNP in a Warmer

- World: Projection and Mechanism. 33rd Conference on Hurricanes and Tropical Meteorology, Ponte Vedra Beach, Florida, April 16-20, 2018.
16. Hsu, H.-H., 2018: Future Projection for Seasonal Precipitation in the Western North Pacific and East Asia by HiRAM under Global Warming. The 3rd International Workshop on Climate Change and Precipitation in the East Asia, Tokyo, February 22-23, 2018. (invited)
  17. Hsu, H.-H., 2017: The Western North Pacific: A hot spot of climate variability and change. Research Center for Advanced Science and Technology (RCAST) Workshop on Climate variability and change, Tokyo, November 19-22, 2017. (invited)
  18. Hsu, H.-H., 2017: Intraseasonal oscillation enhancing C5 typhoon occurrence over the tropical western North Pacific. The 11th East Asian Climate and Environment (EACE) Workshop, Chengdu, China, October 15-17, 2017. (invited)
  19. Hsu, H.-H., 2017: A Brief Review of Asian Climate Variability. International Workshop on Climate Downscaling Studies, Tsukuba, October 2-4, 2017. (invited)
  20. Hsu, H.-H., 2017: Intraseasonal Oscillation Enhances C5 Typhoon Occurrence over the Tropical Western North Pacific. 2017 Joint IAPSO-IAMAS-IAGA Assembly, Cape Town, South Africa, August 28-September 1, 2017.
  21. Hsu, H.-H., 2017: Projecting Future Tropical Cyclone Activity in the WNP Using High Resolving AGCMs. 2017 Joint IAPSO-IAMAS-IAGA Assembly, Cape Town, South Africa, August 28-September 1, 2017.
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  24. Hsu, H.-H., 2017: Improving Madden-Julian Oscillation Simulation: Atmosphere-Ocean Coupling and Land/Orographic Effect. 5th WGNE workshop on systematic errors in weather and climate models, Montreal, Canada, June 19-23, 2017.
  25. Hsu, H.-H., 2017: Compound Effect: Cause of Weather and Climate Extremes? The 2nd International Workshop on Climate Change and Precipitation in the East Asia, Tokyo, March 27-28, 2017. (invited)
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  27. Hsu, H.-H., 2016: Simulating and projecting tropical cyclone activities using HiRAM. The First Taiwan West Pacific Global Forecast System Development Workshop, CWB, Taipei, Taiwan, May 24-27, 2016. (invited)
  28. Hsu, H.-H., 2016: Topographic and Land-Sea Effect of the Maritime Continent on the Air-Sea Interacting MJO. Workshop on YMC and convective processes over the MC and SCS, TGA2016, May 18, 2016. (invited)
  29. Hsu, H.-H., 2016: Topographic and Land-Sea Effect of the Maritime Continent on the Air-Sea Interacting MJO. Workshop on Intraseasonal Processes and Prediction in the Maritime Continent, Singapore, April 11-15, 2016. (invited)
  30. Hsu, H.-H., 2016: Simulating and Projecting Tropical Cyclone Activity in the WNP Using a High-Resolution AGCM. East Asian Climate 13th Workshop, Beijing, March 24-25, 2016.
  31. Hsu, H.-H., 2016: Projection of Taiwan Climate. 2016 TCCIP workshop on Applications of Climate Change Projection, Taipei, March 24-25, 2016. (invited)
  32. Hsu, H.-H., 2016: Expansion of Subtropical High and Associated TC Activity in a Warmer Climate. The International Workshop on "Climate Change and Precipitation in the East Asia, Tokyo, February 29-March 1, 2016. (invited)

33. Hsu, H.-H., 2015: The Madden-Julian Oscillation in a warmer world. 26th IUGG General Assembly, Prague, June 22-July 2, 2015.
34. Hsu, H.-H., 2015: On the extreme 2013/2014 Boreal Winter: role of sea surface temperature and sea ice. 26th IUGG General Assembly, Prague, June 22-July 2, 2015.
35. Hsu, H.-H., 2015: On the extreme circulations in winter 2013-2014: Role of sea surface temperature and sea ice anomalies. The Third Taiwan West Pacific Global Forecast System Planning Workshop, Taipei, June 3-4, 2015. (keynote)
36. Hsu, H.-H., 2015: Climate and topography in East Asia and Taiwan. US-Taiwan Geoscience workshop: Facet (Feedbacks and coupling among climate, erosion and tectonics during mountain building) 2015, Taipei, May 29-31, 2015. (keynote)
37. Hsu, H.-H., 2015: Compound Effects of Anomalous sea surface temperature and ice on extreme circulation in winter of 2013–2014. 2015 Taipei Severe Weather and Extreme Precipitation Workshop, Taipei, May 25-27, 2015. (keynote)
38. Hsu, H.-H., 2015: Development and implementation of TaiESM. Workshop on Modeling Aerosols, Monsoon and Climate: Collaborative Research, Beijing, April 13-14, 2015. (invited)
39. Hsu, H.-H., 2015: Simulating and Projecting Tropical Cyclone Activity in the WNP Using a High-Resolution AGCM. Third International Workshop on “Studies on future climate projection of the Asian region utilizing the CMIP5 multi-model ensemble data”, Tokyo, March 27, 2015. (invited)
40. Hsu, H.-H., 2014: Modeling Activity at RCEC: Development and Implementation of a Global-to-Urban Modeling Suite. 7th Taiwan-France Earth Science Symposium: Geodynamics and Environment in East Asia (GEEA 2014), Hua-Lien, Taiwan, 13-14 November 2014. (keynote)
41. Hsu, H.-H., 2014: On the CCLiCS Research Progress. 3rd CCLiCS Workshop on Climate System Modeling, Taipei, November 11-13, 2014.
42. Hsu, H.-H., 2014: Modeling Activity at RCEC: Development and Implementation of a Global-to-Urban Modeling Suite. International Conference of Geo-Process Modeling in VGE: Managing and Sharing Geographic Knowledge, The Chinese University of Hong Kong, Hong Kong, 6-8 November 2014. (keynote)
43. Hsu, H.-H., 2014: Topographic Influence on the MJO in the Maritime Continent: Diabatic Heating and Moisture. AOGS, Sapporo, Japan, July, 2014.
44. Hsu, H.-H., 2014: Simulated and Projected Interannual Variability in Seasonal Prediction and CMIP Models. AOGS, Sapporo, Japan, July, 2014.
45. Hsu, H.-H., 2014: Modeling Activity at RCEC: Development and Implementation of a Global-to-Urban Modeling Suite. The International Climate and Earth System Modeling Symposium-2014, Nanjing University of Information Science and Technology (NUIST), Nanjing, on April 26-27th 2014. (invited)
46. Hsu, H.-H., W.-L. Tseng, B.-J. Tsuang, N. Keenlyside, and C.-Y. Tu, 2013: Resolving Upper-Ocean Warm Layer Improves MJO Simulation. Asian Monsoon Years (2007-2012) Open Science Conference, 26-27 October 2013, Zhuhai, China. (invited)
47. Hsu, H.-H., Chi-Cherng Hong, Tao-Chi Chang and Ming-Ying Lee: Influence of the Tropical Atlantic on the western north Pacific subtropical high. Tropical Weather and Climate Dynamics (TWCD) Workshop, 9-11 October, 2013. (invited)
48. Hsu, H.-H., 2013: The extremely strong Western North Pacific High in boreal summer 2010: impacts and causes. Davos Atmosphere and Cryosphere Assembly DACA-13 Air, Ice & Process Interactions, 8 – 12 July 2013, Davos, Switzerland.
49. Hsu, H.-H., Chi-Cherng Hong, Tao-Chi Chang, and Ming-Ying Lee, 2013: Influence of the Tropical Atlantic on the Western North Pacific Subtropical High. 12th AMIP/ East Asian Climate (EAC) Workshop, 1-3 July, Busan, Korea.
50. Hsu, H.-H., C.-C. Hong, T.-C. Chang, M.-Y. Lee, T.-T. Lo and N.-H. Lin, 2013: Influence of

- the Atlantic on Climate Variability in the East Asian Pacific. 2013 Taiwan Geosciences Assembly, 15-17 May, Taiwan. (invited)
51. Hsu, H.-H., T.-C. Chang, C.-C. Hong, 2013: Influence of the Tropical Atlantic on the Western Pacific Subtropical High in the boreal summer. 2nd CCLiCS Workshop on Climate System Modeling, 1-3 April, Taipei, Taiwan.
  52. Hsu, H.-H., S. Paul, W.-K. Huang, P.-Y. Hung, 2013: Simulated Interannual variability of East Asian Monsoon in DEMETER, CMIP3 and CMIP5: Tropical vs. Extratropical. 4th WGNE workshop on systematic errors in weather and climate models, 15-19 April, Exeter, United Kingdom.
  53. Hsu, H.-H., 2013: Climate Modeling Activities of the Consortium for Climate Change Study. Workshop on High Performance Computing in Meteorological Application, 29-30 January, Taipei, Taiwan. (invited)
  54. Hsu, H.-H., 2013: Introduction of Climate Change Program for National Science Council of Taiwan. 2013 TCCIP International Conference on Climate Change, 15-16 January, Taipei, Taiwan. (invited)
  55. Hsu, H.-H., M.-Y. Lee, and R.-J. Wu, 2012: AMO-like Interdecadal Variability in the CMIP5 - Are Models Oversensitive to Prescribed Forcing? NTU International Science Conference on Climate Change: Multidecadal and Beyond, September, 17-20, 2012. (invited)
  56. Hsu, H.-H., 2012: Impact of vertical resolution on climate simulation using CESM. 1st Pan-Global Atmospheric System Studies (GASS) Conference: Advances in the Modeling of Atmospheric Physical Processes, 10-14 September, Boulder, Colorado, USA.
  57. Tseng, W.-L., B.-J. Tsuang, N. Keenlyside, H.-H. Hsu, C.-Y. Tu, 2012: Ocean-atmosphere Interaction: Key Aspect of the Madden-Julian Oscillation. AOGS-AGU (WPGM) Joint Assembly, 13-17 August, Sentosa, Singapore.
  58. Hsu, H.-H., and Y. Cheng, 2012: Extratropical stationary wave activity in a warming climate. WCRP Workshop on Coupled Model Intercomparison Project Phase 5 (CMIP5) Model Analysis, 5-9 March, Honolulu, Hawaii.
  59. Hsu, H.-H., 2012: Impact of vertical resolution on climate simulation using CESM. 1st Pan-Global Atmospheric System Studies (GASS) Conference: Advances in the Modeling of Atmospheric Physical Processes, 10-14 September, Boulder, Colorado, USA. NSC98-2111-M-001-013-MY3
  60. Tseng, W.-L., B.-J. Tsuang, N. Keenlyside, H.-H. Hsu, C.-Y. Tu, 2012: Ocean-atmosphere Interaction: Key Aspect of the Madden-Julian Oscillation. AOGS-AGU(WPGM)Joint Assembly, 13-17 August, Sentosa, Singapore. NSC98-2111-M-001-013-MY3.
  61. Tseng, W.-L., Hsu, B. J. Tsuang, N. Keenlyside, H.-H. Hsu, and C. -Y. Tu, 2012: Ocean-atmosphere interaction key aspect of the Madden-Julian Oscillation. 30th Conference on Hurricanes and Tropical Meteorology, 15-20 April, Jacksonville, Florida.
  62. Hsu, H.-H., and K. C. Ko, and C.H. Tsou, 2012: Multiscale Interaction in the Western North Pacific: Do Tropical Cyclones Contribute to Climate Variability? 30th Conference on Hurricanes and Tropical Meteorology, 15-20 April, Jacksonville, Florida
  63. Hsu, H.-H., and K. C. Ko, 2012: Propagation and Maintenance Mechanism of the TC/submonthly Wave Pattern and TC feedback in the Western North Pacific. 30th Conference on Hurricanes and Tropical Meteorology, 15-20 April, Jacksonville, Florida
  64. Hsu, H.-H., 2011: ISO and Multiscale Interaction in the Tropical Western Pacific: A Challenge for Climate Model? CCLiCS Kick-off Workshop on Climate System Modeling, 17-18 November 2011, Taipei, Taiwan.
  65. Hsu, H.-H., 2011: Multiscale interaction in the Western North Pacific: Do tropical cyclones contribute to climate variability? 2011 WCRP OSC Climate Research in Service to Society, 24-28 October, Denver, Colorado, USA.
  66. Hsu, H.-H., and Y.-L. Chen, 2011: Decadal to bi-decadal rainfall variation in the western

Pacific: A footprint of South Pacific decadal variability? WCRP OSC Climate Research in Service to Society, 24-28 October, Denver, Colorado, USA.

67. Ko, K.-C., and H.-H. Hsu, 2011: Propagation and energetic studies of the TC/submonthly Wave Pattern and the TC feedback in the Western North Pacific. Asian Ocean Geophysical Studies (AOGS) Conference, 8-12 August, Taipei, Taiwan.
68. Ko, K.-C., and H.-H. Hsu, 2011: Vorticity and energetic studies of the TC/submonthly Wave Pattern and the TC feedback in the Western North Pacific. 11th AMIP/ East Asian Climate (EAC) Conference, 6-7 August, Kaohsiung, Taiwan.
69. Hsu, H.-H., and Y.-L. Chen, 2011: Decadal to Bi-Decadal Rainfall Variation in the Western Pacific: A Footprint of South Pacific Decadal Variability? 11th AMIP/ East Asian Climate (EAC) Conference, 6-7 August, Kaohsiung, Taiwan.
70. Hsu, H.-H., and P.-Y. Hung, 2011: An Evaluation of East Asian Monsoon Simulation by AOGCMs. Workshop on Hierarchical Modeling of Climate, Trieste, Italy, 18-22 July, 2011.
71. Hsu, H.-H., 2011: Propagation and Maintenance mechanism of the TC/submonthly wave pattern in the Western North Pacific and the Upscaling Feedback of TCs: A barotropic view. 2011 International Union of Geodesy and Geophysics (IUGG) General Assembly, 29 June -5 July, Melbourne, Australia.
72. Hsu, H.-H., 2010: Role of Submonthly Disturbance and 40-50-day ISO on the Extreme Rainfall Event Associated with Typhoon Morakot (2009) in Southern Taiwan. Western Pacific Geophysics Meetings, 22-25 June, Taipei, Taiwan. (Invited)
73. Hsu, H.-H., C. C. Hong and M. Y. Lee, 2010: A diagnosis of the extreme rainfall associated with the typhoon Morakot in southern Taiwan: Roles of submonthly disturbance and 40-50-day ISO. 29th Conference on Hurricanes and Tropical Meteorology, 10-14 May, Tucson, USA. (Invited)
74. Ko, K.-C., and H.-H. Hsu, 2010: Downstream Development of the Summertime TC/Sub-monthly Wave Pattern in the Extratropical North Pacific. 29th Conference on Hurricanes and Tropical Meteorology, 10-14 May, Tucson, USA.
75. Hsu, H.-H., and collaborators, 2010: Special Report on Typhoon Morakot (2009). International Workshop on Typhoon Morakot (2009), 25-26 March, Taipei, Taiwan. (Invited)
76. Hsu, H.-H., 2009: Identification of a multi-decadal teleconnection pattern in the extratropical Northern Hemisphere. 2009 LASG International Summer Symposium, 19-21, August, Yinchuan, China. (invited)
77. Hsu, H.-H., 2009: Issues related to monsoon variability. The 10th "General Circulation Model Simulations of East Asian Climate" workshop, 18-20 August, Yinchuan, China. Yinchuan, China.
78. Hsu, H.-H., and T.-T. Lo, 2009: Recent Synchronized Abrupt Warming and Change in Dominant Decadal Mode. MOCA-09, the IAMAS-IAPSO-IACS 2009 Joint Assembly, 19-29 July, Montreal, Canada.
79. Hsu, H.-H., and W.-L. Tseng, 2009: Effect of Atmosphere-Ocean Interaction on the Tripole rainfall Pattern in East Asia during Boreal summer. MOCA-09, the IAMAS-IAPSO-IACS 2009 Joint Assembly, 19-29 July, Montreal, Canada.
80. Hsu, H.-H., C.-C. Hong, Y.-L. Chen, and M.-Y. Lee, 2008: Two Contrasting Typhoon Seasons: 2008 vs. 2004. International workshop on advanced Typhoon and Flood Research, 18-19 December, Taipei, Taiwan.
81. Hsu, H.-H., and M.-Y. Lee, 2008: Identification of a multi-decadal teleconnection pattern in the extratropical northern hemisphere. Conference on Teleconnections in the Atmosphere and Oceans, 17-20 November, Trieste, Italy.
82. Hsu, H.-H., and T.-T. Lo, 2008: Synchronization of late-1980s abrupt climate changes in the extratropical Northern Hemisphere. International Workshop on Climate Environment System, 29-30 September 2008, Seoul, Korea. (invited)

83. Hsu, H.-H., 2008: Multi-scale Interaction in the Tropical Western North Pacific during the Boreal Summer: from ENSO to TC. Western Pacific Geophysics Meetings, 29 July – 1 August, Cairns, Australia.
84. Hsu, H.-H., C.-H. Hung, A.-K. Lo, C.-C. Wu, and C.-W. Hung, 2008: Influence of Tropical Cyclone on the Climate Variability in the Tropical Western North Pacific. Western Pacific Geophysics Meetings, 29 July – 1 August, Cairns, Australia.
85. Lee, M.-Y., and H.-H. Hsu, 2008: Decadal teleconnection in the Northern Hemisphere. 5th University Allied Workshop 2008, 1-3 July, Tokyo, Japan.
86. Lo, T.-T., and H.-H. Hsu, 2008: The late 1980's climate regime shift during boreal winter. 5th University Allied Workshop 2008, 1-3 July, Tokyo, Japan.
87. Ko, K.-C., and H.-H. Hsu, 2008: ISO Modulation on the Sub-monthly Wave Pattern and the Recurring Tropical Cyclones in the Tropical Western North Pacific. 28th Conference on Hurricanes and Tropical Meteorology, 28 April - 2 May, Orlando, USA.
88. Hsu, H.-H., and C.-H. Wu, 2008: Topographic Effect on the Shift of the MJO Convection through the Maritime Continent. 28th Conference on Hurricanes and Tropical Meteorology, 28 April - 2 May, Orlando, USA.
89. Hsu, H.-H., 2007: Multiscale interaction in the western North Pacific: From ENSO to TC. Ninth Workshop on East Asian Climate/AMIP, Fukuoka, Japan, 10-13 December. (invited)
90. Hsu, H.-H., 2007: Driftsonde program in the THORPEX-PAC. Observation Workshop, 30-31 August, Seoul. (invited)
91. Lo, T.-T., and H.-H. Hsu, 2007: The 1980s Abrupt Climate Change in East Asia. University Allied Workshop 2007, 18-20 June, Beijing.
92. Chen, Y.-L., and H.-H. Hsu, 2007: On Taiwan climate change in a view of climate extreme index. University Allied Workshop 2007, 18-20 June, Beijing.
93. Hsu, H.-H., and C.-H. Wu, 2007: Topographic effect on the shift of the MJO convection through the maritime continent. University Allied Workshop 2007, 18-20 June, Beijing. (invited)
94. Hung, C.-w., H.-H. Hsu, and Y.-M. Li, 2007: Is Winter Dry Season Coming Earlier in East Asia during Recent Decades? Symposium on Global Change, Asian Monsoon, and Extreme Weather and Climate, Pacific Science Council 21, 16-17 June, Okinawa, Japan.
95. Hsu, H.-H., 2007: Climate Change in Taiwan. Symposium on Global Change, Asian Monsoon, and Extreme Weather and Climate, Pacific Science Council, 16-17 June, Okinawa, Japan.
96. Hsu, H.-H., C.-H. Hung, A.-K. Lo, and C.-w. Hung, 2007: Influence of Tropical Cyclone on the Estimation of Climate Variability in the Tropical Western North Pacific. International Symposium on Global Change, Asian Monsoon and Extreme Weather and Climate. Taipei, June 11-12.
97. Yu, Y.-C., H.-H. Hsu, and C.-H. Tsou, 2007: Impact of the land surface process change on the East Asian summer monsoon. Impact of the land surface process change on the East Asian summer monsoon. 2007 年地球科學聯合會，龍潭，5/16-5/17。
98. Wu, C.-H., and H.-H. Hsu, 2007: Influence of the Complex Land-Sea Distribution on the Propagating MJO in the Maritime Continent. 2007 年地球科學聯合會，龍潭，5/16-5/17。
99. Hung, C.-H., and H.-H. Hsu, 2007: Influence of Tropical Cyclone on the Estimation of Climate Variability in the Tropical Western North Pacific. 2007 年地球科學聯合會，龍潭，5/16-5/17。
100. Ko, K.-C., and H.-H. Hsu, 2007: Behavior of sub-monthly wave patterns over the East Asian monsoon area during July-August season. 2007 年地球科學聯合會，龍潭，5/16-5/17。
101. Chang, C.-W., H.-H. Hsu, and C.-R. Wu, 2007: South China Sea interannual variability. 2007 年地球科學聯合會，龍潭，5/16-5/17。
102. Lo, T.-T., and H.-H. Hsu, 2007: The 1980s Abrupt Climate Change in East Asia. 2007 年地球科學聯合會，龍潭，5/16-5/17。

103. Hsu, H.-H., 2007: Asymmetry of the Tri-pole Rainfall Pattern during East Asian Summer. Symposium on Predictability of Climate Variations in the Indo-Pacific Sector. March 8-9, 2007, Tokyo, Japan. (invited)
104. Hsu, H.-H., 2006: Climate Change in Taiwan. Symposium on Impact Evaluation of Global Warming and Approach to Risk Analysis in East Asia. 31 October-2 November. 2006, Taipei, Taiwan. (invited) Lo, T.-T., and H.-H. Hsu, 2007: The 1980s Abrupt Climate Change in East Asia. 2007 年地球科學聯合會，龍潭，5/16-5/17。
105. Hsu, H.-H., 2006: Estimating the contribution of tropical cyclone to climate variability. APEC Climate Center (APCC) Symposium, 14-16 September, Busan, Korea. (invited)
106. Hsu, H.-H., 2006: Climate variability in East Asia: From long-term trend to tropical cyclone. University Allied Workshop: Climate and Environmental Studies for Global Sustainability. 18-20 July, Taipei, Taiwan. (invited)
107. Hsu, H.-H., A.-K. Lo, C.-H. Hung, and C.-C. Wu, 2006: Possible feedback of tropical cyclone on climate variability. 27th Conference on Hurricanes and Tropical Meteorology, 24-28 April 2006, Monterey, California.
108. Hsu, H.-H. and S.-M. Lin, 2006: The tri-pole pattern of East Asian summer rainfall. Symposium on Asian Monsoon, Winter MONEX: A Quarter Century and Beyond, 4-7 April, Kuala Lumpur, Malaysia. (invited)
109. Raju, P.V.S., H.-H. Hsu, and Y.-C. Yu, 2006: Projected climate changes over East Asian summer monsoon. Eighth AMIP/East Asian Climate Workshop, 31 March-1 April, Nantou, Taiwan.
110. Hsu, H.-H., A.-K. Lo, C.-H. Hung, and C.-C. Wu, 2006: Possible feedback of tropical cyclone on climate variability. Eighth AMIP/East Asian Climate Workshop, 31 March-1 April, Nantou, Taiwan.
111. K.-C. Ko, and H.-H. Hsu, 2006: Relationship between sub-monthly variability and tropical cyclones over the East Asian summer monsoon area during 1991-2001. Eighth AMIP/East Asian Climate Workshop, 31 March-1 April, Nantou, Taiwan.
112. Hung, C.-w., and H.-H. Hsu, 2006: The first transition of the Asian summer monsoon, intraseasonal oscillation, and Taiwan Meiyu. Eighth AMIP/East Asian Climate Workshop, 31 March-1 April, Nantou, Taiwan.
113. Hsu, H.-H., 2006: The tri-pole pattern of East Asian summer rainfall. Eighth AMIP/East Asian Climate Workshop, 31 March-1 April, Nantou, Taiwan.
114. Hsu, H.-H., 2005: A Dynamical Downscaling System for Climate Prediction in Taiwan. Workshop on Meteorology and Climate over South China, 5-8 December, Hong Kong. (invited speaker)
115. Hsu, H.-H., 2005: A Dynamical Downscaling System for Climate Prediction in Taiwan. 天氣分析與預報研討會，台北，民國 94 年 10 月。
116. Hsu, H.-H., 2005: Tropical cyclone – intraseasonal oscillation in the western North Pacific. The University Allied Workshop for Climate and Environmental Modeling. Busan, Korea, 11-13 July.
117. Hsu, H.-H., 2005: The tri-pole rainfall pattern. The First International Symposium by the China, Korea, and Japan Meteorological Societies – Atmospheric Sciences in East Asia, University of Tokyo, Tokyo, Japan, 13-14 May. (invited)
118. Hsu, H.-H., and C.-T. Chen, 2004: Observed and Projected Climate Change in Taiwan. International Symposium on Global Climate Change and Agricultural Disasters Mitigation Techniques (氣候變遷及農業氣象災害防護國際研討會), Tai-Chung (台中霧峰), 26-27 October, 2004. Hsu,
119. 許晃雄、郭芯穎, 2004: 台灣豪大雨、特大豪雨與超大豪雨發生頻率與分佈之初步分析。第七屆區域氣候模擬研討會，中壢中央大學，10 月 5-6 日，2004。

120. Hsu, H.-H., 2004: A Dynamical Downscaling System for Climate Prediction in Taiwan. Short-Term Climate Prediction and Application Workshop, Central Weather Bureau, Taipei, 30 September - 1 October, 2004.
121. Hsu, H.-H. and T.-T. Lo, 2004: The 1950's abrupt climate change in East Asia. The 1st International CLIVAR Science Conference, Baltimore, Maryland, 21-25 June, 2004.
122. Hsu, H.-H. and X. Liu, 2004: Relationship between the Tibetan Plateau heating and the East Asian summer monsoon rainfall. 26th Conference on Hurricanes and Tropical Meteorology, May, 2004.
123. Hsu, H.-H. and T.-T. Lo, 2004: The 1950's abrupt climate change in East Asia. Seventh Workshop on General Circulation Model Simulation of East Asian Climate, Honolulu, 18-20 February.
124. Hsu, H.-H. and X. Liu, 2004: Relationship between the Tibetan Plateau heating and the East Asian summer monsoon rainfall. Seventh Workshop on General Circulation Model Simulation of East Asian Climate, Honolulu, 18-20 February.
125. Hsu, H.-H., 2004: Intraseasonal variability in the East Asian and Western Pacific monsoon regions. International Asian Monsoon Symposium, 2004, Honolulu, 18-20 February. (Invited speaker)
126. Hsu, H.-H., 2003: Relationship between the Tibetan Plateau heating and the East Asian summer monsoon rainfall. International Kick-off Symposium for 'Kyoto University Active Geosphere Investigations' (KAGI 21), 16-17 December, 2003. (Invited speaker)
127. 許晃雄, 劉新, 2003: The relationship between the Tibetan Plateau heating and the East Asian summer monsoon rainfall. 天氣分析與預報研討會, 15-17 September 2003。
128. 許晃雄, 2003: 台灣極端降水與鄰近地區的大氣與海洋狀況。The 6th Regional Climate Simulation Workshop, Chung-Li, 18-19 September 2003.
129. Yu, Y.-C., H.-H. Hsu, W.-S. Kau, C.-H. Tsou, W.-R. Hsu, and W.-Y. Sun, 2003: An evaluation of the East Asian summer monsoon simulation by the Purdue regional model. The 6th Regional Climate Simulation Workshop, Chung-Li, 18-19 September 2003.
130. Hsu, H.-H., 2003: Simulation of the 1998 East Asian summer monsoon using Purdue regional climate model. The Second Workshop on Regional Climate Modeling for Monsoon System. Yochohama, Japan, 3-6 March 2003.
131. 許晃雄、翁春雄, 2002: Contrasting Characteristics between the Northward and Eastward Propagation of the Intraseasonal Oscillation during the Boreal Summer。海峽兩岸大氣科學研究生學術研討會, 12月19-20日, 台北。
132. 許晃雄, 2002: 從澇到旱: 2001年夏季-2002年春季間大尺度環流的轉變。兩岸乾旱與災變天氣研討會, 12月17-18日, 台北。
133. Hsu, H.-H., J.-M. Chen, Q.-H. Chen, and Y.-L. Chan, 2002: Climate variability in Taiwan – An overview. Seasonal Climate Monitoring and Prediction Workshop, 4-6 December 2002, Taipei.
134. 許晃雄、于宜強、柯文雄、許武榮、商文義, 2002: PRM 在 1998 年東亞夏季季風與季內振盪之模擬研究。天氣分析與預報研討會, 台北, 民國 91 年 10 月 17-18 日, 142-146 頁。
135. W.-S. Kau, H.-H. Hsu and R.-T. Chen, 2002: Does the Anomalous SST Lead to the Contrasting Characteristics of the 1993 and 1994 EASM? Sixth Workshop on General Circulation Model Simulation of East Asian Climate, Harbin, 5-6 August.
136. Hsu, H.-H., W.-S. Kau and J.-L. Chu, 2002: AMIP Simulation of ISO during the Boreal Summer. Sixth Workshop on General Circulation Model Simulation of East Asian Climate, Harbin, 5-6 August.
137. Hsu, H.-H. and C.-H. Weng, 2002: Contrasting Characteristics between Northward and Eastward Propagation of the Intraseasonal Oscillation during Boreal Summer. Sixth Workshop on General Circulation Model Simulation of East Asian Climate, Harbin, 5-6 August.
138. Hsu, H.-H., W.-R. Hsu, W.-S. Kau, and W.-Y. Sun, 2002: Simulation of the onset of the 1998



East Asian summer monsoon. International Conference on East Asian Climate, Harbin, 7-9 August.

139. Wang, W.-C., W.-S. Kau, H.-H. Hsu, and C.-H. Tu, 2002: Characteristics of cloud radiative forcing over East Asia. 13th Symposium on Global Change and Climate Variations, Orlando, Florida, 14-17 January, 2002.
140. Hsu, H.-H., W.-S. Kau, and J.-L. Chu, 2002: Summertime intraseasonal variability in the AMIP simulations. 13th Symposium on Global Change and Climate Variations, Orlando, Florida, 14-17 January, 2002.
141. Kau, W.-S., H.-H. Hsu, and R. T. Chen, 2002: Contrasting characteristics of the 1993 and 1994 East Asia summer monsoon: Observation and simulation. 13th Symposium on Global Change and Climate Variations, Orlando, Florida, 14-17 January, 2002.
142. 陳仁增、許晃雄、柯文雄：1993 與 1994 年夏季降水與大尺度海氣環流之關係。第七屆全國大氣科學學術研討會，466-471。
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146. Hsu, H.-H. and C.-T. Chen, 2001: Leading climate change mode in the IPCC scenario simulations. "Climate and Climate Change: Human Influences on Past and Future Climates" Symposium, IAMAS 2001, Innsbruck, Austria, 10-18 July, 2001.
147. Hsu, H.-H., and C.-H. Weng, 2001: Northwestward and westward propagation of the intraseasonal oscillation during the boreal summer: Mechanism and structure. 11th Conference on Interaction of the Sea and Atmosphere, San Diego, California, May 14-17, 2001.
148. Hsu, H.-H., and S.-P. Weng, 2001: Potential contribution of the intraseasonal oscillation to the stratosphere-troposphere coupling. Workshop on Coupling of the Stratosphere and Troposphere by Dynamical, Radiative and Chemical Processes, Kyoto, 13-17 March, 2001. (invited)
149. Hsu, H.-H. and C.-T. Chen, 2000: Leading modes in the IPCC climate change scenario simulation. "Climate Environment System Research Center" Workshop, Seoul, 15-16 November, 2000. (invited)
150. Hsu, H.-H., and C.-T. Chen, 2000: Climate changes in Taiwan: Past, present, and future. 中澳環境模擬與管理研討會，台中，台灣，28-30 June，2000。(invited)
151. Hsu, H.-H., and C.-T. Chen, 2000: Climate changes in Taiwan: Past, present, and future. International Conference on Sustainable Development for Island Societies, Chungli, Taiwan, 20-22 April, 2000. (invited)
152. Hsu, H.-H., and C.-H. Weng, 2000: Intraseasonal ocean-atmosphere-land interaction during northern summer. 10th Conference on Interaction of the Sea and Atmosphere. Fort Lauderdale, Florida, May 29-June 2, 2000.
153. Hsu, H.-H., Y.-L. Chen, and W. S. Kau, 2000: Effects of ocean-atmosphere interaction on the winter temperature in Taiwan and East Asia. Fifth Workshop on General Circulation Model Simulation of East Asian Climate, Seoul, Korea, April 26-28.
154. 許晃雄、陳正達、柯文雄、鄒治華，1999：台灣環境變遷與全球氣候變遷衝擊之評析-氣候。八十八年度國科會永續發展研究計畫成果研討會。
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156. 王嘉琪，許晃雄，1999：夏季亞洲地區 NCEP/NCAR，NASA/DAO，及 ECMWF 分析資料之地面熱通量比較。第六屆全國大氣科學學術研討會。

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