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EDUCATION

1992-Sep. ~ 1996-Jun. Ph.D. Graduate Institute of Atmospheric Physics,
National Central Uni., Taiwan

1990-Sep. ~ 1992-Jun. M.S. Graduate Institute of Atmospheric Physics,
National Central Uni., Taiwan

1986-Sep. ~ 1990-Jun. B.S. Department of Atmospheric Sciences, Chinese Culture Uni., Taiwan

EMPLOYMENT

2015-Jul. ~ present Research Fellow RCEC, Academia Sinica, Taiwan

2015-Sep. ~ present Adjunct Professor, National Central Uni., Taiwan

2010-Oct. ~ 2015 Jul. Associate Research Fellow, RCEC, Academia Sinica, Taiwan

2011-Sep.~2015 Sep. Adjunct Associate Professor, National Central Uni., Taiwan

2009-Sep. ~2011.Sep. Adjunct Assistant Professor, National Central Uni., Taiwan

2006-Jun. ~2010 Oct. Research Fellow RCEC, Academia Sinica, Taiwan

HONORS & AWARDS

2017 Annual Research Highlight, RCEC, Academia Sinica

2014 Best Article Award, 26th The Chinese Institute of Environmental Engineering conference

2012 Short-term overseas visiting Award, Ministry of Science and Technology

2009 Best article Award, 10th Aerosol conference, China & 6th Cross-Strait aerosol conference

2008 Most Cited Article Award (2004-2008) Journal: *Terrestrial, Atmospheric & Oceanic Sciences*

2006 Annual Research Highlight, RCEC, Academia Sinica

1996 The Phi Tau Phi Scholastic Honor, R.O.C.

ACADEMIC SERVICE

2020-Mar.~present Editorial Board Members, Journal: "Atmosphere"

2017-Aug.~present Associate Editors, Journal: *Terrestrial, Atmospheric and Oceanic Sciences (TAO)*

2015-May~2017 Apr. Secretary General, Meteorological Society of the Republic of China

2015, External Examiner for Doctoral Thesis, Earth System and GeoInformation Science, The Chinese University of Hong Kong Graduate School

2014~present Chair of the Curriculum committee for Earth System Science Program, Taiwan International Graduate Program (TIGP-ESS), Academia Sinica

2014 Mar~2014 Nov., Member, Admission Committee for Earth System Science Program, Taiwan International Graduate Program (TIGP-ESS), Academia Sinica,

2010~2016 Board member, Taiwan Group on Earth Observation (TGEO)

2011~2017 Board member, Environmental Protection, Taiwan,

RESEARCH INTERESTS

Mesoscale Meteorology, Regional Climate Changes, Urban Heat Island Effect, Urban pollution, Air quality modeling

RESEARCH HIGHLIGHTS

- **Improved urban canopy model in WRF and applications:** This study evaluated the impact of urbanization over northern Taiwan using the Weather Research and Forecasting (WRF) model coupled with the Noah land-surface model and a modified Urban Canopy Model (WRF-UCM2D). In the original UCM coupled in WRF (WRF-UCM), when the land use in the model grid is identified as “urban”, the urban fraction value is fixed. Similarly, the UCM assumes the distribution of anthropogenic heat (AH) to be constant. Such not only may lead to over- or underestimation of urban fraction and AH in urban and non-urban areas, spatial variation also affects the model-estimated temperature. To overcome the above-mentioned limitations and to improve the performance of the original UCM model, WRF-UCM is modified to consider the 2-D urban fraction and AH (WRF-UCM2D). The improved simulation performance of WRF-UCM2D at non-urban areas is attributed to the energy exchange which enables efficient turbulence mixing at low urban fraction. **The achievement of this study has a crucial implication for assessing the impacts of urbanization on weather, air quality and regional climate.**
- **Regional Climate Changes study:** It is difficult and inadequate to use a global model alone for projecting future climate changes such as Taiwan, a complex geographic nature island, due to its coarse resolution. We have performed dynamic downscaling of Taiwan’s climate in the recent past (1979-2003) and climate change projection for the near and distant future (2015-2039 and 2075-2099, respectively) by using the Weather Research Forecasting (WRF) model. The simulation is forced by the Max Plank Institute Hamburg, global model, ECHAM5/MPIOM. Projection of future climate changes revealed both altitudinal and latitudinal variations in warming trend, with more **significant temperature increase in mountain areas than in plain areas** toward

the end of the 21st century and **more obvious warming in the north than in the south of Taiwan**. The results obtained in this study can be applied to other regions of similar latitudes and with comparable relief.

- **Impact of Biomass burning pollutants from Indochina to Taiwan:** For the long-range transport of air pollutants to Taiwan, we found the sources also could come from biomass burning in the Indochina Peninsula (Indochina) in the low troposphere over East Asia in springtime. Actually, due to Taiwan's unique geographic location, the complex interactions of these air pollutants in the boundary layer and aloft, especially those associated with northeasterly and south/southwesterly winds, have resulted in complex characteristics in the lower troposphere over Taiwan. We successfully simulated and evaluated the radiative impact of biomass burning produces aerosols and air pollutants to Taiwan during springtime in Southeast Asia. According to the simulation results, 34% of the AOD was attributed to organic carbon (OC) over Indochina, while the contribution of black carbon (BC) to AOD was about 4%. During the study period, biomass-burning aerosols over Indochina have a net negative effect (-26.85 Wm^{-2}) at ground surface, a positive effect (22.11 Wm^{-2}) in the atmosphere and a negative forcing (-4.74 Wm^{-2}) at the top of atmosphere. **Under the influence of biomass-burning aerosol plume transported by strong wind, there is a NE-SW zone stretching from southern China to Taiwan with reduction in shortwave radiation of about 20 Wm^{-2} at ground surface.** Such significant reduction in radiation attributed to biomass-burning aerosols and their impact on the regional climate in East Asia merit attention.

PUBLICATIONS (*: corresponding author)

Peer-reviewed papers (Selected):

1. Kueh, M-T., W.-M., Chen, Y. F. Sheng, Simon C. Lin, T.-R. Wu, Eric Yen, Y. L Tsai, **C. Y. Lin***, 2019 : Impacts of Horizontal Resolution and Air–Sea Flux Parameterization on the Intensity and Structure of Tropical Cyclone, *Nat. Hazards Earth Syst. Sci.* 19, 1509–1539, 2019. <https://doi.org/10.5194/nhess-19-1509-2019>
2. Koralegedara, S.B., **C.-Y. Lin***, Y.-F. Sheng, 2019, Numerical Analysis of the Mesoscale Dynamics of an Extreme Rainfall and Flood Event in Sri Lanka in May 2016. *J. Meteor. Soc. Japan*, 97 (4), 821-839, <https://doi.org/10.2151/jmsj.2019-046>.
3. **Lin C.-Y.***, Y. H. Lee, C-Y. Kuo, W.-C., Chen, Y. F. Sheng, C-J. Su, 2018, Impact of river-dust events on air quality of western Taiwan during winter monsoon: observed evidence and model simulation, *Atmospheric Environment*, 192, 160-172. <https://doi.org/10.1016/j.atmosenv.2018.08.048>
4. Kueh, M-T, **C.-Y. Lin***, Y-J Chuang, Y-F Sheng, Y-Y Chien, 2017, Climate variability of heat waves and their associated diurnal temperature range variations in Taiwan, *Environmental Research Letters*, (<https://doi.org/10.1088/1748-9326/aa70d9>).

5. **Lin C.-Y.***, Y-Y Chien, C-J. Su, M-T Kueh, S-C. Lung, **2017**, Climate variability of heat wave and projection of warming scenario in Taiwan, *Climatic Change*,
<https://doi.org/10.1007/s10584-017-2091-0>
6. **Lin C.-Y.***, C-J. Su, H. Kusaka, Y. Akimoto, Y.F. Sheng, J.C. Huang, H.H. Hsu, **2016**: Impact of an improved WRF-urban canopy model on diurnal air temperature simulation over northern Taiwan, *Atmos. Chem. Phys.*, **16**, 1809-1822, **2016**. <https://www.atmos-chem-phys.net/16/1809/2016/acp-16-1809-2016.pdf>
7. Koralegedara, S.B., **C.-Y. Lin***, Y.F. Sheng, C. H. Kuo, **2016**, Estimation of anthropogenic heat emissions in urban Taiwan and their spatial patterns , *Environmental Pollution*, **215**, 84-95.
<https://www.sciencedirect.com/science/article/pii/S0269749116303232>
8. **Lin C.Y.***, Y.J. Chua, Y.F. Sheng, H.H. Hsu, C.T. Cheng, Y.Y. Lin, **2015**: Altitudinal and latitudinal dependence of future warming in Taiwan simulated by WRF nested with ECHAM5/MPIOM; *International Journal of Climatology*, **35**, 1800-1809, DOI: 10.1002/joc.4118. <https://rmets.onlinelibrary.wiley.com/doi/full/10.1002/joc.4118>
9. **Lin C. Y.***, C. Zhao, X. Liu, N. H. Lin, W.N.Chen, **2014**: Modeling of long-range transport of Southeast Asia biomass burning pollutants to Taiwan and their radiative forcing over East Asia, *Tellus B*, **66**, 1-17. 23733. <http://dx.doi.org/10.3402/tellusb.v66.23733>.
10. **Lin C. Y.***, , Y. F. Sheng, W.-N. Chen, Z. Wang, C.-H. Kuo, W.-C. Chen, T. Yang, **2012a**: The impact of channel effect on Asian dust transport dynamics: A case in southeastern Asia, *Atmos. Chem. Phys.* **12**, 1-15. <https://www.atmos-chem-phys.net/12/271/2012/>
11. **Lin C. Y.***, C.C.K Chou, Z. Wang, S.C. Lung, C. T. Lee, C.S. Yuan, W. N. Chen, S. Y. Chang, S. C. Hsu, W. C. Chen, Shaw. C. Liu **2012b**: Impact of different transport mechanisms of Asian dust and anthropogenic pollutants to Taiwan. *Atmospheric Environment*, **60**, 403-418, (<http://dx.doi.org/10.1016/j.atmosenv.2012.06.049>)
12. **Lin, C.Y.***, H.m. Hsu, Y.F. Sheng. C.H. Kuo and Y.A. Liou, **2011**, Mesoscale processes for super heavy rainfall of Typhoon Morakot (2009) over southern Taiwan, *Atmos. Chem. Phys.* **11**, 345-361. DOI: 10.5194/acp-11-345-2011. <https://www.atmos-chem-phys.net/11/345/2011/>
13. **Lin C. Y.***, W.C. Chen, P.-L. Chang and Y.F. Sheng, **2011**: Impact of urban heat island effect on the precipitation over complex geographic environment in northern Taiwan, *Journal of Applied Meteorology and Climatology*, **50**, no.2, 339-353. doi: 10.1175/2010JAMC2504.1,
14. **Lin, C.Y.***, C.C. Chang, C.Y. Chan, C.H. Kuo, W.C. Chen, D.Allen Chu, Shaw C. Liu, 2010: Characteristic of springtime profiles and sources of ozone in the low troposphere over northern Taiwan, <https://doi.org/10.1016/j.atmosenv.2009.10.020> *Atmospheric Environment*, **44**, 182-193.
15. **Lin, C.Y.***, H.M. Hsu, Y.H. Lee, C. H. Kuo, Y.F. Sheng, D. A. Chu, **2009a**: A new transport mechanism of biomass burning from Indochina as identified by modeling studies., *Atmos. Chem. Phys.*, **9**, 7901-7911. DOI: 10.5194/acp-9-7901-2009 <https://doi.org/10.5194/acp-9-7901-2009>
16. **Lin, C.-Y.***, S.-C. Lung, H-R. Guo, P.-C. Wu, H.-J. Su, **2009b**: Climate variability of cold surge and its impact on the air quality of Taiwan. *Climatic Change*. **94**, 457-471.

<https://doi.org/10.1007/s10584-008-9495-9> DOI: 10.1007/s10584-008-9495-9

17. **Lin C.Y***, H. Hsu, Y. H. Lee, C. H. Kuo, Y.F. Sheng, D.A. Chu , **2009c**, A New Transport Mechanism of Biomass Burning from Indochina as Identified by Modeling Studies, *Atmos. Chem. Phys. Discuss.* **9**, 13155-13176. <https://doi.org/10.5194/acp-9-7901-2009>
18. **Lin, C-Y***, F Chen, J Huang, Y. A. Liou, W.C. Chen, W.N. Chen, Shaw C. Liu, **2008a**: Urban Heat Island Effect and its Impact on Boundary Layer Development and Land-Sea Circulation over Northern Taiwan, *Atmospheric Environment*, 42,5639-5649. <https://doi.org/10.1016/j.atmosenv.2008.03.015> DOI: 10.1016/j.atmosenv.2008.03.015
19. **Lin, C-Y.***, W.-C. Chen, Shaw. C. Liu, Y. A. Liou, G.R. Liu, T.-H. Lin, **2008b**: Numerical study of the impact of urbanization on the precipitation over Taiwan, *Atmospheric Environment*, 42, 2934-2947. <https://doi.org/10.1016/j.atmosenv.2007.12.054> DOI: 10.1016/j.atmosenv.2007.12.054
20. **Lin, C.-Y.***, Z. Wang, W-N. Chen, S-Y. Chang, C.C.K. Chou, N.Sugimoto and Z. Zhao, **2007a**: Long-range transport of Asian dust and air pollutants to Taiwan: Observed evidence and model simulation, *Atmos. Chem. Phys.* 7, 423-434. <https://doi.org/10.5194/acp-7-423-2007>
21. **Lin, C.-Y.***, Z. Wang, C.C.-K. Chou, C.-C. Chang, and S.C. Liu, **2007b**: A numerical study of an autumn high ozone episode over southwestern Taiwan, *Atmospheric Environment*, 41, 3684-3701, (doi:10.1016/ j.atmosenv. 2006.12.050) <https://doi.org/10.1016/j.atmosenv.2006.12.050>
22. **Lin, C.-Y.***, Shaw C. Liu, Charles C.-K. Chou , Saint-Jer Huang , Chung-Ming Liu, Ching-Huei, Kuo , and Chea-Yuan Young, **2005**: Long-range transport of aerosols and their impact on the air quality of Taiwan. *Atmospheric Environment*, 39,6066-6076. DOI: 10.1016/j.atmosenv.2005.06.046
23. **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", *Terrestrial atmospheric and Oceanic Sciences*. 15, No5, 759-784. DOI: 10.3319/TAO.2004.15.5.759(ADSE)
24. **Lin, C.-Y.*** and C.-S. Chen; **2002**: A study of orographic effects on mountain-generated precipitation systems under weak synoptic forcing. *Meteorology and Atmospheric physics.*, 2002, 81,1-25. DOI: 10.1007/s007030200028 <https://doi.org/10.1007/s007030200028>