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EDUCATION

2013/02 – 2020/02 Ph.D. Dept of Space Science & Engineering, National Central Univ., Taiwan
2008/09 – 2010/08 M.S. Graduate Institute of Space Sciences, National Central Univ., Taiwan
2002/09 – 2007/08 B.A. Dept of Atmospheric Science, National Central Univ., Taiwan

EMPLOYMENT

2021/04 – present Postdoctoral Researcher RCEC, Academia Sinica, Taiwan
2020/04 – 2021/04 Postdoctoral Researcher Inst. of Environ. Eng., National Taiwan Univ., Taiwan

HONORS & AWARDS

2020 Dean's Award, College of Earth Sciences, National Central University
2014 An-Ming Fu Memorial Award, Chinese Society of Photogrammetry and Remote Sensing, Taiwan
2014 Outstanding Student Paper Award, 7th Remote Sensing Symposium across Taiwan Strait

PROFESSIONAL SERVICE

- Director: Taiwan Association of Space Technology, 2017-2020

RESEARCH INTEREST

My research lies in the fields of environmental remote sensing and aerosol remote sensing using satellite data. I am interested in studying (1) the aerosol classification of multispectral characteristics (especially for hygroscopic urban-industrial aerosols and hydrophobic biomass burning aerosol) and its application of satellite observations; (2) the simulation of effects of black carbon aging on fractal morphologies (cluster-cluster algorithm and generalized multiparticle Mie-solution) and radiation properties (i.e., the effects of black carbon aging on radiative forcing changing at the top of the atmosphere); (3) to utilize satellite technology (oversampling method) for analyzing the spatiotemporal trend of ozone sensitivity (formaldehyde-to-NO_2 ratio; FNR) and atmospheric oxidation capacity (AOC) in Taichung and whole Taiwan; and (4) to develop an aerosol optical depth

algorithm with high-spatiotemporal-resolution features and fuse air quality data with machine learning.

RESEARCH HIGHLIGHTS

1. **Ozone sensitivity inferred from satellite measurements**
   Ozone and secondary organic aerosol (SOA) considerably harm human health and significantly affect the Earth's climate. O3 formation is mainly driven by two directly emitted precursors: nitrogen oxides (NO_x) and volatile organic compounds (VOC). The relationships of chemical species produced during ozone formation, such as HCHO and NO_2, reflect the processes that determine the non-linear sensitivity of O_3 to its precursor emissions of VOC and NO_x. By combining satellite measurements and oversampling methods, the results of satellite-based HCHO and NO_2 can publish more effective emission control policies for specific seasons and areas.
2. **Retrieving aerosol optical depth with high spatiotemporal coverage by satellite data**
   Satellite remote sensing provides an alternative method to monitor air quality widely and extend data coverage. The Himawari-8 satellite is a new generation of geosynchronous meteorological satellites with wavelengths ranging from 0.47 to 13.3 μm and conducts full-disk observations every 10 min. The difficulty of current algorithms lies in making most appropriate assumptions about both the surface and atmospheric contributions (e.g., aerosol types). Using the image comparison concept, near-real-time and high spatiotemporal AOD (spatial resolutions of 1 km, every 10 min.) can obtain without aerosol type assumption. The lack of AOD retrievals would be expected to fill space coverage with machine learning skills.

REPRESENTATIVE PUBLICATIONS (*: corresponding author)

1. Chang, P.-K., Griffith, S.M., Chuang, H.-C., Chuang, K.-J., Wang, Y.-H., Chang, K.-E., Hsiao, T.-C.*, 2022. Particulate matter in a motorcycle-dominated urban area: Source apportionment and cancer risk of lung deposited surface area (LDSA) concentrations. Journal of Hazardous Materials 427, 128188. https://doi.org/10.1016/j.jhazmat.2021.128188
2. Ting, Y.-C., Young, L.-H., Lin, T.-H., Tsay, S.-C., Chang, K.-E., Hsiao, T.-C.*, 2022. Quantifying the impacts of PM2.5 constituents and relative humidity on visibility impairment in a suburban area of eastern Asia using long-term in-situ measurements. Science of The Total Environment 818, 151759. https://doi.org/10.1016/j.scitotenv.2021.151759
3. 郭人維, 黃智遠, 張國恩, 林唐煌*, 劉振榮, 2020. 高時空融合影像在氣膠光學厚度反演之應用. 航測及遙測學刊 25. https://doi.org/10.6574/JPRS.202006_25(2).0001
4. Lin, T.-H.*, Chang, K.-E., Chan, H.-P., Hsiao, T.-C., Lin, N.-H., Chuang, M.-T., Yeh, H.-Y., 2020. Potential Approach for Single-Peak Extinction Fitting of Aerosol Profiles Based on In Situ Measurements for the Improvement of Surface PM2.5 Retrieval from Satellite AOD Product. Remote Sensing 12, 2174. https://doi.org/10.3390/rs12132174

5. Januar, T.W., Lin, T.-H.*, Huang, C.-Y., Chang, K.-E., 2020. Modifying an Image Fusion Approach for High Spatiotemporal LST Retrieval in Surface Dryness and Evapotranspiration Estimations. Remote Sensing 12, 498. https://doi.org/10.3390/rs12030498
6. Griffith, S.M.*, Huang, W.-S., Lin, C.-C., Chen, Y.-C., Chang, K.-E., Lin, T.-H., Wang, S.-H., Lin, N.-H.*, 2020. Long-range air pollution transport in East Asia during the first week of the COVID-19 lockdown in China. Science of The Total Environment 741, 140214. https://doi.org/10.1016/j.scitotenv.2020.140214
7. Chang, K.-E., Hsiao, T.-C., Hsu, N.C., Lin, N.-H., Wang, S.-H., Liu, G.-R., Liu, C.-Y., Lin, T.-H.*, 2016. Mixing weight determination for retrieving optical properties of polluted dust with MODIS and AERONET data. Environmental Research Letters 11, 085002. https://doi.org/10.1088/1748-9326/11/8/085002