Xingyi WU

Atmospheric Environment | PhD applicant for Fall 2027
12432902@mail.sustech.edu.cn | +86-18659183205 | https://xingyi-wu.github.io/

EDUCATION

Southern University of Science and Technology (SUSTech) **Shenzhen, China**
M.S. in Geophysics, GPA: 3.47/4.0 Expected July 2027
Supervisor: **Prof. Lei Zhu** | zhul3@sustech.edu.cn
Willing to provide a reference letter upon request.
Research: Satellite observation and model interpretation of glyoxal diurnal variations over East Asia

Nanjing University of Information Science & Technology (NUIST) **Nanjing, China**
B.S. in Atmospheric Science, GPA: 3.66/5.0 July 2024
Supervisor: **Prof. Jianbing Jin**
Research: Relationship between seasonal methane observations and rice cultivation in China

RESEARCH EXPERIENCE

Validation of GEMS glyoxal retrievals over East Asia against TROPOMI, MAX-DOAS, and GEOS-Chem

- **Research problem.** How reliable is the GEMS glyoxal product, and which retrieval steps may explain its differences from other independent observations?
- **Key findings.** GEMS and TROPOMI show good spatial agreement over land, but GEMS glyoxal columns are 12.3–31.0% lower than TROPOMI and 43.2% lower than MAX-DOAS. Differences in differential slant columns, the reference sector, and *a prior* profiles help explain the discrepancies.
- **My contributions.** Prepared the observation and model datasets, built the validation workflow, and carried out the statistical analysis in Python. Reviewed the retrieval documentation and examined how individual retrieval steps affect the product comparison.

SUSTech | Prof. Lei Zhu | Jul 2024 – Jun 2026

Urban diurnal glyoxal sources and sinks revealed by GEMS and GEOS-Chem

- **Research problem.** What drives the different diurnal glyoxal patterns observed over East Asian cities?
- **Key findings.** The balance between chemical production and loss helps explain the distinct diurnal patterns. Aromatic compounds and isoprene are important precursors, while aerosol uptake and photolysis are major loss pathways.
- **My contributions:** Ran GEOS-Chem simulations, discussed the model updates with the researcher who developed them, and analyzed glyoxal production and loss pathways to investigate differences among cities.

SUSTech | Prof. Lei Zhu | May 2025 – present

Seasonal Methane Concentration Variations Related to Rice Cultivation in China

- **Research problem.** How is the seasonal variation in satellite-observed methane over China related to rice cultivation?
- **Key findings.** Used STL decomposition and K-means clustering to identify four regional patterns of methane seasonality from 2018 to 2022 and examined their relationship with rice cultivation.
- **My contributions.** Proposed the time-series analysis approach, collected satellite methane and rice cultivation data, and carried out the STL decomposition and K-means clustering.

NUIST | Prof. Jianbing Jin | Mar 2024 – Oct 2024

PUBLICATIONS

1. **Wu, X.**, Zhu, L. *, Zhang, A., Li, X., Fu, W., Kwon, H.-A., Park, R. J., Ha, E. S., Lee, G. T., Min, K.-E., Liu, S., Li, Y., Zhang, X., Zhang, P., Zhang, J., Huang, Y., Zhang, L., Li, J., Luan, X., Fu, T.-M., Yang, X., Shen, H., Ye, J., and Wang, C.: **Evaluation of GEMS glyoxal retrievals with TROPOMI product, MAX-DOAS observations, and GEOS-Chem simulations**, *Earth and Space Science*, *under review*.

2. **Wu, X.**, Zhu, L. *, Zhang, A., Fu, T.-M., Zhang, X., Fu, W., Kwon, H.-A., Park, R. J., Ha, E. S., Lee, G. T., Min, K.-E., Liu, S., Li, Y., Li, X., Li, Y., Zhang P., Zhang J., Huang Y., Zhang L., Li J., Luan X., Yang, X., Shen, H., Ye, J., and Wang, C.: **Chemical controls on the diurnal variability of glyoxal over East Asian hotspots: insights from GEMS and GEOS-Chem**, *in prep*.

3. **Wu, X.**, Jin J. *, Xia J., Fang, L., and Liao H.: **Seasonal Methane Concentration Variations Related to Rice Cultivation in China**, *Chinese Journal of Atmospheric Sciences*, 50(2): 463−477, https://doi.org/10.3878/j.issn.1006-9895.2504.24111, 2026. (*in Chinese*)

PRESENTATION

1. Oral presentation, **Investigating Glyoxal (CHOCHO) Sources and Sinks in the Pearl River Delta through GEMS Satellite Observations and BOXMOX Model Simulations**, *the Asia-Oceania Geosciences Society (AOGS) 2025 Annual Meeting*, Singapore, Singapore, Jul 30, 2025.

2. Oral presentation, **Evaluation and Interpretation of GEMS Glyoxal Products**, *the 17th GEMS International Workshop*, Seoul, Korea, Sep 10, 2026.

3. Oral presentation, **Satellite Observations and Chemical Simulations of Diurnal Glyoxal Variations in Urban Areas**, *the 6th Strait Urban Environment Forum*, Fuzhou, China, Nov 7, 2025. (**Excellent Presentation Award**)

4. Oral presentation, **Multi-scale Observations and Chemical Simulations of Urban Diurnal Glyoxal Variations**, *the 13th National Conference on Environmental Chemistry (NCEC 2025)*, Jiangmen, China, Nov 30, 2025.

AWARDS AND HONORS

- Highest-Tier Research Assistantship Stipend for Master's Students, SUSTech, 2026
- First-Class Academic Scholarship for Graduate Students, SUSTech, 2025
- International Conference Grant, 10000 RMB, SUSTech, 2025
- Outstanding Postgraduate Teaching Assistant, SUSTech, 2025
- Outstanding Postgraduate Students, SUSTech, 2024–2025
- Outstanding Undergraduate Graduates, NUIST, 2024

TECHNICAL SKILLS

Programming: Python (main), MATLAB, Fortran, C

Atmospheric Models: GEOS-Chem (main), WRF-Chem, BOXMOX

Computing: Linux, High performance computing (HPC)

Dataset: GEMS and TROPOMI products, EDGAR emission inventories, ASIA-AQ and KORUS-AQ airborne observations, JPL chemical kinetics, Google Earth Engine

LANGUAGE

English: IELTS Academic: 6.5 (Aug 2026); CET-6: 526, **Mandarin**: native