INDERJEET SINGH

Department of Energy, Environmental and Chemical Engineering, Washington University in St. Louis, MO, USA

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EDUCATION

Ph.D., Washington University in St. Louis, St. Louis, USA Environmental Engineering, mentor: Professor Randall V. Martin	*2019-2025*
Ph.D., Dalhousie University, Halifax, Canada Atmospheric science, mentor: Professor Randall V. Martin	*2018-2019*
M. Tech., Indian Institute of Technology Kharagpur, Kharagpur, India Earth System Science and Technology, mentor: Professor ANV Satyanarayana	*2016*
B.Tech., Punjab Technical University, Jalandhar, India Mechanical Engineering	*2012*

PROFESSIONAL EXPERIENCE

Research Assistant with Professor ANV Satyanarayana at IIT Kharagpur, India	*2016-2018*
Lecturer Rayat-Bahra Institute of Engineering and Biotechnology, Mohali, Punjab	*2012-2014*

RESEARCH INTEREST

- Air quality modelling
- Radiative Transfer and Remote Sensing
- Atmospheric Turbulence

My research interest involves the development of analytical and physics-based approaches to understand the physical and chemical processes affecting the atmospheric composition. My research focuses primarily on the efficient representation of aerosols in the chemical transport model GEOS-Chem. This includes an accurate representation of mineral dust morphology, and vertical distribution of smoke during the wildfire events.

SCHOLARSHIPS AND AWARDS

- AGU Outstanding Student Presentation Award (OSPA)	*2024*
- Ministry of Human Resource Department (MHRD)	*2014*
- Central Scientific and Industrial Research (CSIR) Scholarship	*2014 (Declined)*

SKILL

- **Technical Model:** GEOS-Chem, UNL-VRTM, LibRadtran
- **Programming:** Fortran, Python, and MATLAB
- **Language:** English, Punjabi, Hindi

PUBLICATIONS

5. **Inderjeet Singh,** Randall V. Martin. Evaluation of mass scattering efficiency from SPARTAN network against GEOS-Chem chemical transport model. (In preparation)

4. **Singh, I**., Martin, R. V., van Donkelaar, A., Li, C., Zhang, Y., Zhu, H., Zhang, D., & Lyapustin, A. (2025). Effects of Fire Plume Height on the Geophysical Estimation of Surface Fine Particulate Matter from Satellite Aerosol Optical Depth during North American Wildfires. *ACS ES&T Air*. (link)

3. **Singh, I.**, Martin, R. V., Bindle, L., Chatterjee, D., Li, C., Oxford, C., et al. (2024). Effect of dust morphology on aerosol optics in the GEOS-chem chemical transport model, on UV-vis trace gas retrievals, and on surface area available for reactive uptake. Journal of Advances in Modeling Earth Systems, 16, e2023MS003746. (link)

2. Zhu, H., Martin, R. V., van Donkelaar, A., Hammer, M. S., Li, C., Meng, J., Oxford, C. R., Liu, X., Li, Y., Zhang, D., **Singh, I.**, and Lyapustin, A.: Importance of aerosol composition and aerosol vertical profiles in global spatial variation in the relationship between PM2.5 and aerosol optical depth, Atmos. Chem. Phys., 24, 11565–11584, 2024. (link)

1. Zhu, H., Martin, R. V., Croft, B., Zhai, S., Li, C., Bindle, L., Pierce, J. R., Chang, R. Y.-W., Anderson, B. E., Ziemba, L. D., Hair, J. W., Ferrare, R. A., Hostetler, C. A., **Singh, I.**, Chatterjee, D., Jimenez, J. L., Campuzano-Jost, P., Nault, B. A., Dibb, J. E., Schwarz, J. S., and Weinheimer, A.: Parameterization of size of organic and secondary inorganic aerosol for efficient representation of global aerosol optical properties, Atmos. Chem. Phys., 23, 5023–5042, 2023. (link)

PRESENTATION

4. Effects of fire plume height on geophysical estimation of surface $PM_{2.5}$ from satellite AOD during extreme wildfire events of 2020 over North America, AGU conference, Washington DC, December 2024 (Poster)

3. Effects of fire plume height on geophysical estimation of surface $PM_{2.5}$ from satellite AOD during extreme wildfire events of 2018 over North America, 11th International GEOS-Chem meeting, St. Louis, June 2024 (Poster)

2. Effects of dust non-sphericity on atmospheric modelling, 10th International GEOS-Chem meeting, St. Louis, June 2022 (Poster)

1. Effects of dust non-sphericity on atmospheric modelling, AGU conference, New Orleans, December 2021 (Poster)

TEACHING

Transport Phenomena in EECE (EECE 501)	Washington University	Teaching Assistant	*Spring, 2020*
Thermodynamics II in EECE (EECE 204)	Washington University	Teaching Assistant	*Fall, 2020*