

## Special Issue

# Tracking Atmospheric SO<sub>2</sub> Across Scales: Sources, Emissions, Dispersion, Chemical Transformation and Downwind Impacts

### Message from the Guest Editors

Sulfur dioxide (SO<sub>2</sub>) is a crucial metric for understanding and managing atmospheric pollution, linking source strength and emission variability to atmospheric dispersion, oxidation pathways, sulfate formation, and wet and dry deposition, ultimately shaping downwind air quality. Quantifying the source-to-impact pathway still presents a challenge. SO<sub>2</sub> plumes evolve within highly variable boundary-layer regimes, including coastal circulations, and complex terrain. Additionally, chemical transformation depends on oxidant availability, humidity, cloud processing, and heterogeneous reactions that differ markedly across different spatial and temporal scales. These complexities propagate uncertainty into model-based assessments of exposure and impacts. This Special Issue aims to consolidate new advances and integrative approaches that enable the robust tracking of atmospheric SO<sub>2</sub> across various scales from sources and emissions to dispersion, SO<sub>2</sub> oxidation, and downwind impacts. We welcome contributions spanning field observations, remote sensing, laboratory and chamber experiments, and numerical modeling that improve process understanding and strengthen model evaluation.

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### Guest Editors

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### Deadline for manuscript submissions

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## Atmosphere

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## About the Journal

### Message from the Editor-in-Chief

Continued developments in instrumentation and modeling have driven atmospheric science to become increasingly more complex with a deeper understanding of concepts, mechanisms, and interactions. This is the field that innovation built and it has led to a better appreciation for the complexity with atmosphere. Human life is intertwined in this complexity as we strive to better understand our atmosphere. Climate change is constantly stretching the limits of our thinking and forcing new ideas and concepts to be played out. Welcome to the Anthropocene!

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### Editor-in-Chief

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