

Special Issue

Low-Altitude Boundary-Layer Flows and Dispersion: Insights from Experiments, Modeling and AI

Message from the Guest Editors

The low-altitude boundary layer constitutes the lowest portion of the atmospheric boundary layer, where flow dynamics and dispersion characteristics are significantly influenced by surface roughness. Characterizing or predicting flows over heterogeneous surfaces, such as urban terrain, is particularly challenging due to non-uniform shear stress, flow recirculation, and heterogeneous heat and pollutant sources. Nevertheless, this region encompasses the environment where urban residents live, and understanding local wind flows and air pollutant dispersion is critical for improving urban safety and living conditions. Additionally, complex shear flows pose operational risks for low-altitude unmanned aerial vehicles (UAVs).

This Special Issue aims to advance contemporary methodologies and deepen our understanding of flow and dispersion phenomena in low-altitude boundary-layer environments. We invite high-quality studies employing traditional approaches (field observations, wind tunnel experiments, numerical simulations, and theoretical analysis), as well as novel AI techniques.

Guest Editors

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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!

Editor-in-Chief

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