Special Issue

Impacts of Building Ventilation and Air Filtration Systems on Indoor Pollutant Exposure

Message from the Guest Editors

People are surrounded by a diverse spectrum of gaseous and particulate air pollutants indoors, from a variety of sources, many of which can accumulate to harmful levels if not properly controlled. Because people spend over 85% of their time indoors, the cumulative exposures indoors may outweigh those from outdoor environments, making indoor air quality (IAQ) a critical determinant of human health and well-being. Ventilation and air filtration systems represent the primary engineering controls for mitigating pollutant exposure, yet their effectiveness depends on multiple factors such as design, operation and environmental conditions. Moreover, emerging challenges—such as increasing urban air pollution, energy efficiency requirements, climate-driven shifts in building operation and the heightened attention to airborne disease transmission—underscore the urgent need to reassess how building systems can be optimized to protect occupants while balancing energy and sustainability goals.

Guest Editors

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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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