

Advanced Environmental Wind Engineering

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This book is highly suitable for advanced courses as it introduces state-of-the-art information and the latest research results on diverse problems in the environmental wind engineering field. The topics include indoor natural ventilation, pedestrian wind environment, pollutant dispersion, urban heat island phenomena, urban ventilation, indoor/outdoor

thermal comfort, and experimental/numerical techniques to analyze those issues. Winds have a great influence on the outdoor environment, especially in urban areas. Problems that they cause can be attributed to either strong wind or weak wind issues. Strong winds around high-rise buildings can bring about unpleasant, and in some cases dangerous, situations for people in the outdoor environment. On the other hand, weak wind conditions can also cause problems such as air pollution and heat island phenomena in urban areas. Winds enhance urban ventilation and reduce those problems. They also enhance natural ventilation in buildings, which can reduce the energy consumption of mechanical ventilation fans and air conditioners for cooling. Moderate winds improve human thermal comfort in both indoor and outdoor environments in summer. Environmental wind engineering associated with wind tunnel experiments and numerical analysis can contribute to solutions to these issues.

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