

# Development and Validation of an Algebraic Turbulence Model for Outdoor Airflow and Contaminant Simulations around a Building

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## **Abstract**

The design of outdoor environment requires a tool that could provide fast and reliable simulations for outdoor airflow and contaminant dispersions. This investigation has developed and validated a new algebraic turbulence model for outdoor environment design. The new model was tested by a natural ventilation case and two contaminant dispersion cases. The computed air velocities and contaminant concentrations agree well with the wind tunnel measurements. The computation time for the new model is about two times faster than the time needed by the standard k- $\epsilon$  model with an even better accuracy for the three validation cases.

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