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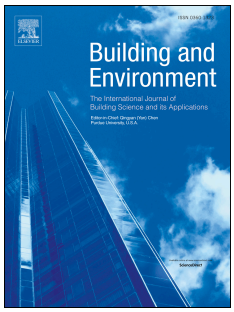

Field measurement of natural ventilation rate in an idealised full-scale building located in a staggered urban array: Comparison between tracer gas and pressure-based methods

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Title**:** Field measurement of natural ventilation rate in an idealised full-scale building located in a staggered urban array: comparison between tracer gas and pressure-based methods

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Highlights:

- Extensive comparison of measured full-scale ventilation rates using tracer gas and pressure-based methods.
- Tracer gas and pressure-based measured ventilation rates are not linearly related in realistic meteorological conditions, regardless of temperature effects.
- Better agreement occurs between the two ventilation measurement methods if non-obvious jet formed near the opening in the array case.

Abstract

Currently, no clear standards exist for determining urban building natural ventilation rates, especially under varying realistic meteorological conditions. In this study, ventilation rates are determined using tracer gas decay and pressure-based measurements for a full-scale (6 m tall) cube. The cube was either isolated (2 months of observations) or sheltered within a staggered array (7 months), for both single-sided and cross ventilation (openings 0.4 x 1 m). Wind speeds at cube height ranged between 0.04 m s^{-1} and 13.1 m s^{-1}. Errors for both ventilation methods are carefully