

Supplementary materials for “Optimal ventilation rate for effective displacement ventilation”

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1 Comparison of plume velocity

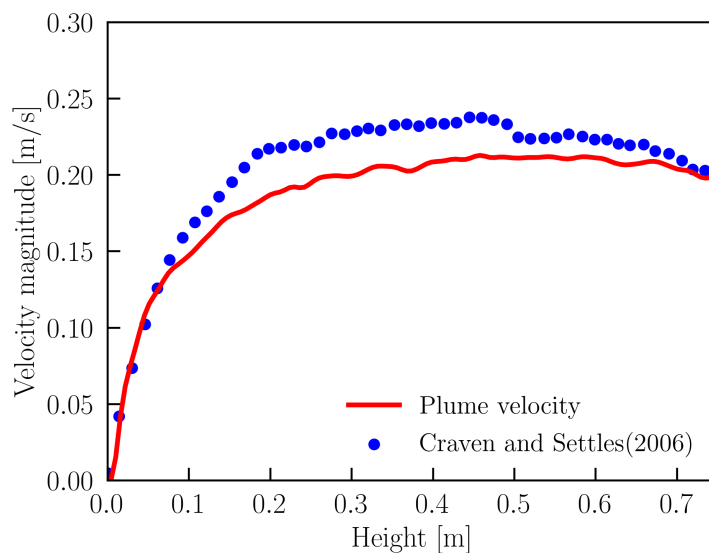


Figure S1: Plume centerline velocity distribution with height above head. It shows good agreement with the experiment by Craven & Settles (2006).

2 Grid sensitivity

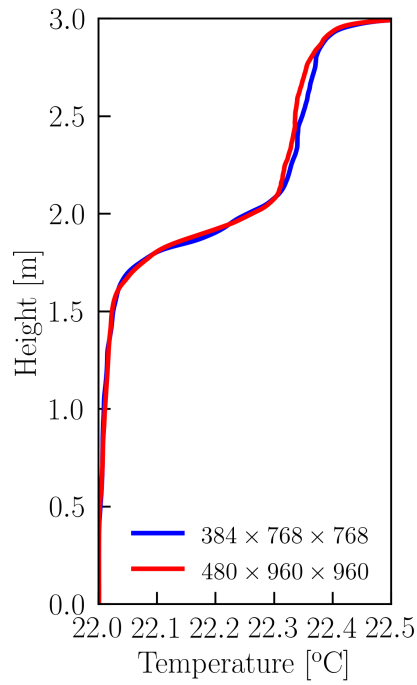


Figure S2: The averaged temperature profile of the displacement ventilation with ACH=5 under two different resolutions to show the independence of grid.

3 The profile of temperature gradient

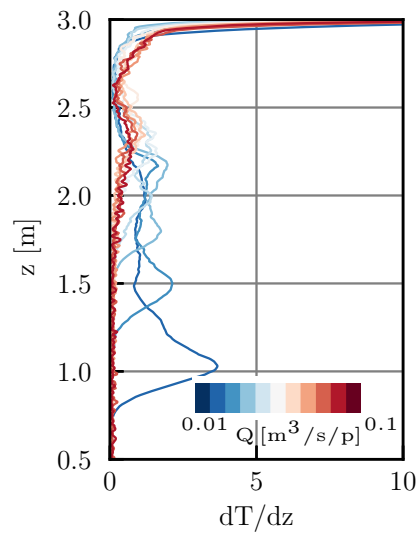


Figure S3: The averaged temperature gradient profile of the displacement ventilation for various Q values.

4 Supplementary movies

- Movie 1. Temperature field of the displacement ventilation with $Q=0.01 \text{ m}^3/\text{s}/\text{person}$
- Movie 2. CO_2 field of the displacement ventilation with $Q=0.01 \text{ m}^3/\text{s}/\text{person}$
- Movie 3. Temperature field of the displacement ventilation with $Q=0.05 \text{ m}^3/\text{s}/\text{person}$
- Movie 4. CO_2 field of the displacement ventilation with $Q=0.05 \text{ m}^3/\text{s}/\text{person}$
- Movie 5. Temperature field of the displacement ventilation with $Q=0.1 \text{ m}^3/\text{s}/\text{person}$
- Movie 6. CO_2 field of the displacement ventilation with $Q=0.1 \text{ m}^3/\text{s}/\text{person}$

References

Craven, B. A. & Settles, G. S. 2006 A computational and experimental investigation of the human thermal plume. *J. Fluids Eng.* 128.