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Yang Yang, Yi Wang, Bingbing Song, Jianing Fan, Yingxue Cao

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#### ACCEPTED MANUSCRIPT

# Stability and accuracy of numerical investigation of droplet motion under local ventilation airflow

Yang Yang<sup>1</sup>; Yi Wang<sup>1\*</sup>; Bingbing Song<sup>1</sup>; Jianing Fan<sup>1</sup>; Yingxue Cao<sup>1</sup> Xi'an University of Architecture and Technology, Xi'an, 710055, China

### 6 Abstract

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7 It is challenging to predict droplet motion in numerical studies of particulate transport in indoor environment. This paper attempts at providing answers on this topic while 8 9 using an Eulerian-Lagrangian method. The effect of the droplet release number and evaporation on prediction stability and accuracy was evaluated by modeling the 10 droplet motion for two initial droplets (10 and 100 µm) and three different airflow 11 12 patterns in an upper-receiving ventilation system. The results show that the effect of the droplet release number on prediction stability depends on the spatial scale of 13 14 droplet motion, airflow pattern, and droplet number in a certain domain. Evaporation 15 affected the motion and distribution of droplets, especially for those with an initial 16 diameter of 100 µm. The number of droplets with an initial diameter of 100 µm escaping into the indoor environment was over predicted when ignoring droplet 17 evaporation. The results may contribute to more accurate predictions of droplet 18

<sup>\*</sup>Corresponding author. Tel: 86029 82202729; Fax: 0086 029 82202729;

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