

Urban Ventilation for typical summer and heatwave events in Hong Kong

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Air ventilation plays a crucial role in thermal stress mitigation in high-density cities, especially under extreme hot weather conditions. The aim of this study is to have a better understanding of urban ventilation in Hong Kong for typical summer and heat wave events. Hong Kong is selected as the study area, since it is one of the most densely populated cities in the world, and on the other hand, with global warming, the numbers of Very Hot Days ($T_{max} \geq 33^{\circ}\text{C}$) and Very Hot Nights ($T_{min} \geq 28^{\circ}\text{C}$) in Hong Kong have increased in recent decades.

While some knowledge on local influence of buildings on ventilation already exists, little is known about orographic influences. Hong Kong is surrounded by water and has a hilly and mountainous terrain. This heterogeneous topography makes the wind patterns particularly complex. Therefore, we specifically focus on the influence of the orographic features on local mesoscale meteorology, in terms of land-sea breezes and katabatic winds.

For the studies we use the non-hydrostatic mesoscale model METRAS with a horizontal spatial resolution of 350 m. The model situations are based on the weather classification study for heat waves from The Chinese University of Hong Kong (Ren and Derrien, 2018). The results will help local stakeholders and decision makers to improve urban planning and to develop appropriate adaptation measures and mitigation strategies to face the future heat wave events (Cheng, 2019).

Literatur:

Cheng G., 2019. Urban ventilation for typical summer and heatwave events in Hong Kong, master thesis in preparation.

Ren C. and Derrien I., 2018. Synoptic weather typing and its application to heatwaves in Hong Kong, unpublished.