

Relative importance of regional and local pollutant sources in deep street canyons

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ABSTRACT:

Particulate concentrations within the Pearl River Delta region are strongly influenced by regional sources and transport. This is also true for small, highly urbanised cities such as Hong Kong. Nevertheless, local sources within a deep street canyon will dominate below a certain height. Despite advances in dispersion modelling and understanding of street-level airflow dynamics, so far little is known about the relative importance of regional and local sources when realistic urban topography is considered. In this study, we use a high-resolution mesoscale model (WRF) and building-resolving large-eddy simulation model (PALM) to determine the relative importance of regional and local sources to particulate concentrations in Hong Kong. The mesoscale meteorological fields are validated against surface and radiosonde observations from the Hong Kong Observatory. For simplicity, the particulates are assumed to be completely passive. The effects of different weather conditions, urban geometries and emission scenarios are analysed.

KEYWORDS: regional and local pollutant sources, WRF, PALM, Hong Kong