

## Environmental Research, Technology Demonstration and Conference Project

<b>ECF Project:</b>	ECF 2018-21
<b>Project Title:</b>	Fine particulate matter pollution from incense burning at temples in Hong Kong
<b>Principal Investigator:</b>	Dr Wong Pui Yun, Paulina, Science Unit, Lingnan University
<b>Total Approved Grant:</b>	\$499,920
<b>Duration:</b>	1/6/2019 to 31/10/2021
<b>Project Status/Remarks:</b>	Completed
<b>Project Scope:</b>	<p>The project will examine the spatial and temporal characteristics of the fine particulate matter (PM<sub>2.5</sub>) emissions from incense burning at temples located within the densely populated urban areas of Hong Kong. The project will integrate field measurements with a geographical information system (GIS) to determine the potential negative health effects of these particulates on local communities. An online GIS application will be developed to disseminate the findings and to facilitate public engagement in environmental health management. The success of this proposed project will not only collect evidence of the ambient air pollution created by incense burning at temples, but will also contribute to methodological advances in the field of environmental health and will provide support for future policies.</p>
<b>Summary of the Findings/Outcomes:</b>	<p>The project examined the spatial and temporal characteristics of the fine particulate matter (PM<sub>2.5</sub>) emissions from five incense burning temples located within the densely populated urban areas of Hong Kong. Field measurements were integrated with GIS to determine the potential negative health effects of these particulates on local communities.</p> <p>Based on the comparison of inside and outside PM<sub>2.5</sub> emissions, this study explored the ambient concentrations of PM<sub>2.5</sub> and the air infiltration between inside and outside of the temples. This study also examined the spatial distribution pattern and temporal variation of PM<sub>2.5</sub> concentrations from incense burning temples to the local community. Day/night comparison and spatial interpolation were performed.</p> <p>The project results indicated that winter measurements on all aspect (i.e. inside, outside and surrounding) exhibited nearly two times higher pollutant concentrations than the summer measurements due to northerly winds in winter will increase air pollution.</p> <p>The inside measurement of the temples all registered significantly higher concentrations with average concentrations, compared to the immediate outside measurements with average concentrations. The measurements of the immediate outside locations were in general also registered a relatively high concentrations compare to the surrounding measurements (i.e. roadside, park and others) with average concentrations. In addition, the results exhibited that daytime concentrations were higher than night-time for both seasons, due to active burning activities in daytime. The impact of incense burning to the immediate surrounding environment of the temple</p>

	<p>were also significant during the opening hours in both seasons. A substantial decay, in average approximately 40% (summer) and 70% (winter) in air pollutants levels for the first 50m of the temple were observed. Further regression model confirmed that meteorological factors (i.e. air temperature, relative humidity and wind speed) have exhibited some effects to the PM2.5 emissions and the spatial dispersion pattern.</p>
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