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ASSESSMENT OF STREET AIR POLLUTION THROUGH OSPM MODEL IN LAHORE, PAKISTAN

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Abstract

Vehicular emissions are one of the main contributors in worsening the air quality of developing countries like Pakistan. The current research work is an effort to find out emission factor of different classes of vehicles as well as to model the certain air pollutants level on five different main streets of Lahore, Pakistan. The Town Hall air quality monitoring station at Mall road is taken as background station. The data of street configuration, background urban air pollution, meteorological conditions, diurnal traffic count and emission factor of vehicles was calculated to model the street air pollution. Operational Street Pollution Model (OSPM) was used to model the street pollutants. $PM_{2.5}$ levels exceed National Environmental Quality Standards (NEQS) during all months of calendar year, while SO_2 and NO_2 exceed NEQS during entrance of heavy traffic at night in the city. Diesel vehicles have high SO_2, NOx, $PM_{2.5}$ and PM_{10} emission factors; while gasoline vehicles have high CO emission factors. Industrial region has relatively high level of SO_2 emissions; while roadside have relatively high level of CO emissions. A significant correlation (r-value > 0.5) was observed between modeled and observed results for all the streets for the NOx, SO_2 and CO levels, except for NOx level at Gulberg (r-value= 0.42). The better modeling results have been observed for those streets which are relatively polluted spots and are close to the background station.

Keywords: background, emission factor, modeling, traffic, Pakistan, street configuration

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