

Estimation of PM_{2.5} Emissions and Source Apportionment Using Receptor and Dispersion Models

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Abstract : Source apportionment using Dispersion model depends primarily on the quality of Emission Inventory. In the present study, a CMB receptor model has been used to identify the sources of PM_{2.5}, while the AERMOD dispersion model has been used to account for missing sources of PM_{2.5} in the Emission Inventory. A statistical approach has been developed to quantify the missing sources not considered in the Emission Inventory. The inventory of each grid was improved by adjusting emissions based on road lengths and deficit in measured and modelled concentrations. The results showed that in CMB analyses, fugitive sources - soil and road dust - contribute significantly to ambient PM_{2.5} pollution. As a result, AERMOD significantly underestimated the ambient air concentration at most locations. The revised Emission Inventory showed a significant improvement in AERMOD performance which is evident through statistical tests.

Keywords : CMB, GIS, AERMOD, PM_{2.5}, fugitive, emission inventory

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