

DISPERSION PATTERN OF SULFUR DIOXIDE FROM MULTIPLE INDUSTRIAL POINT SOURCES IN THE URBAN COASTAL AREA OF TROPICAL REGION

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ABSTRACT

This study analyze the spatial dispersion pattern of Sulfur dioxide (SO₂) from 192 industrial stacks in Chennai, a coastal city in India, located in the tropical zone. Industrial Sources Complex Short Term Model version 3(ISCST3) was performed for 12 months (June-2011 to July-2012) and 16 wind direction sectors of 22.5° resolution were employed. The spatial dispersion pattern of SO₂ revealed that it varies every month, depends on the prevailing seasonal and meteorological conditions. August and September in the Pre-monsoon season, and November in the monsoon season were the critical periods receiving maximum range of ground-level concentrations of SO₂ (27μg/m³ to 30μg/m³) due to steady wind pattern. The unsteadiness prevailing in the wind direction due to transition of monsoon season, during October and February, enhance the dispersion and drastically reduces the ground-level concentration of SO₂ to 17μg/m³. The results of the study demonstrate that much fluctuations in the wind direction not only prevents over dumping of pollutants in a particular downwind sectors, but also enhance the areas of dispersion and reduces the ambient concentration level of pollutants.

KEYWORDS: Wind Direction Sector, Ground-Level Concentration, Sulphur Dioxide (SO₂)