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16. Applications

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A Mathematical Model and Simulation of Transport of Dust Particles in Dar es Salaam City

A mathematical model for simulation of transport of dust particles in Dar es Salaam City has been developed and a closed solution obtained.

The model is based on an analytical solution of 2-Dimensional Diffusion Equation of dust over rough ground surface. Dust is considered to originate from a point source, which act as dust source of variable strength and spread all places down wind under the influence of horizontal wind, which varies logarithmically with height. Dust particles also settles under the influence of gravitation attraction.

Simulation of the model revealed that the concentration of dust at any place down wind is much affected by surface elements, ie. Dust concentration decreases as surface roughness increases but increases with increase in zero plane displacement