Numerical Modeling of Air Pollution with PM-Particles and Dust

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Abstract : The subject of our study is atmospheric air pollution with numerical modeling. In the presented article, as the object of research, there is chosen city Tbilisi, the capital of Georgia, with a population of one and a half million and a difficult terrain. The main source of pollution in Tbilisi is currently vehicles and construction dust. The concentrations of dust and PM (Particulate Matter) were determined in the air of Tbilisi and in its vicinity. There are estimated their monthly maximum, minimum, and average concentrations. Processes of dust propagation in the atmosphere of the city and its surrounding territory are modelled using a 3D regional model of atmospheric processes and an admixture transfer-diffusion equation. There were taken figures of distribution of the polluted cloud and dust concentrations in different areas of the city at different heights and at different time intervals with the background stationary westward and eastward wind. It is accepted that the difficult terrain and mountain-bar circulation affect the deformation of the cloud and its spread, there are determined time periods when the dust concentration in the city is greater than MAC (Maximum Allowable Concentration, MAC=0.5 mg/m^3).

Keywords : air pollution, dust, numerical modeling, PM-particles

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