A NUMERICAL SIMULATION OF SECONDARY SPM ORIGINATED FROM AUTOMOBILES WITH LAGRANGIAN MODEL

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Air pollution is getting serious in urban areas by increase of automobile traffic. A variety of methods to control the traffic have been proposed, but efficiency of the methods has not been examined quantitatively yet. It is important to develop a system to simulate a series of pollution processes from an occurrence of automobile traffic to diffusion and deposition of pollutants. Eulerian model and Lagrangian model are suggested to simulate diffusion of pollutants. The former is adequate to deal with the bigger scale phenomena such as urban scale and more. On the other hand the latter is adequate to the smaller scale phenomena such as impact analysis of the particular point source. Otherwise we can't find researches that a photochemical reaction is considered in Lagrangian model. We expect to reduce the cost and to be able to simulate various kinds of air pollutions by sharing analysis between Eulerian model and Lagrangian model. In this study, in order to simulate SPM originated from automobiles, we constructed an integrated model composed of a mesoscale meteorological simulation model (HOTMAC), a random-puff model to calculate transport process of pollutants (RAPTAD), a photochemical reaction model (CBM-IV), SPM generation model proposed by Japan Environmental Agency and an automobile pollutant emission model. We calculated behavior of secondary SPM originated from automobiles in Osaka Prefectural area under various meteorological conditions to examine validity of the simulation model.