**Monte Carlo Simulation of Optical Radiation Transfer Process in Stochastic Scattering Media**

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The talk deals with a number of aspects related to statistical modeling of processes of optical radiation transfer in scattering and absorbing media. Space-time variations of optic parameters of these media are assumed to have a random character. Algorithms of the Monte Carlo method and a set of programs, which allow construction of numerical models of the electromagnetic radiation field in such media have been developed. The set is mainly intended for solving stochastical problems of the cloudy atmosphere optics. Some issues connected with construction of the 3D random fields of continuous and broken cloudiness are discussed. The main emphasis is being given to the discussion of algorithms of simulation of radiation fields in clouds and cloudy atmosphere. A special attention has been paid to solving the problem of optimization of Monte Carlo algorithms. The optimization is based on the method of “dependent trials’’.

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