
Summary: The physical and geometrical models of the heterogeneous porous medium with direct view of its microstructure are worked out. The algorithm of calculating the energy and pulse probability distributions for the particles interacting with the complex chemical compound is developed. The distributions are used for detail modeling of the scattering and absorption processes in complex heterogeneous materials. An approach for the discrete description of the realistic geometry of the heterogeneous porous medium with direct view of its structure at the micro level is elaborated. The approach includes the algorithm of build the detector system for statistical estimation of the radiation energy deposit in an irradiated object. The applications of the developed simulation tool are presented in terms of results obtained with use of the hybrid computing cluster K-100.

MSC:
82C70 Transport processes in time-dependent statistical mechanics
82C22 Interacting particle systems in time-dependent statistical mechanics
82D03 Statistical mechanical studies in condensed matter (general)
74J20 Wave scattering in solid mechanics
82M99 Basic methods in statistical mechanics

Keywords:
radiation transport; porous medium; material micro structure

Software:
MCNP

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References:


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