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Reflection method in problems of electrostatics and thermal conductivity of plane-layered media consisting of two films

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The electrostatic reflection method is formulated and proven for a point charge located next to a plane-layered medium consisting of two films on a dielectric half-space. The method is generalized to the case of an arbitrary system of charges and is applied to the solution of mathematically similar problems of electrostatics and stationary thermal conductivity of plane-layered media. In particular, as an example of the application of the method, the problem of finding the distributions of electrostatic potential around a conducting sphere located near a plane-layered structure consisting of two dielectric films on a dielectric half-space is considered. Solutions to similar problems of finding the temperature distribution of uniformly heated bodies located near a heat-conducting flat-layer structure of two heat-conducting films on a heat-conducting half-space are discussed.

Keywords: plane-layered medium, reflection method, electrostatics, thermal conductivity.

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