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DETERMINATION OF THE PONDEROMOTIVE MAGNETIC FORCE WHEN CALCULATING THE FIELD BY THE CONFORMAL TRANSFORMATION METHOD

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Abstract

The method of conformal transformation has been widely applied to the research of devices using ponderomotive action of the magnetic field. This method enables the analysis and calculation of stationary 2D electric and magnetic fields meeting the Laplace equation. It allows essential simplification of the problem of the field calculation. However, its basic drawback consists in the absence of the general method for the determination of the complex potential. Consequently, it is usually impossible to obtain expressions for the magnetic field strength and its ponderomotive force in the explicit form as a function of coordinates in the initial domain. This paper deals with the solution to the problem of direct determination of the specific ponderomotive force of the magnetic field with the use of complex potential with the known function of conformal transformation. The analyzed examples of the calculation of the ponderomotive force in the working zone of the poles of different shapes can be a model for the research of the traction performance of the electromagnetic systems of magnetic separating devices. Besides, the obtained expressions can also be used in the calculation of the systems working on the principle of the ponderomotive action of the electrostatic field. References 12, figures 2.

Key words: ponderomotor force, magnetic field strength, conformal transformation method, magnetic systems

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