The mathematical models of electromagnetic field dynamics and heat transfer in closed electrical contacts including Thomson effect

Stanislav N.KHARIN [1,2], Merey M.SARSENGELDIN [1,2,3],
Samat KASSABEK [1,2,3]

[1] *Kazakh-British Technical University, Almaty, Kazakhstan*
[2] *Institute of Mathematics and Mathematical Modelling, Almaty, Kazakhstan*
[3] *Suleyman Demirel University, Almaty, Kazakhstan*

Abstract: We represent mathematical models of electromagnetic field dynamics and heat transfer in closed symmetric and asymmetric electrical contacts including Thomson effect, which are essentially nonlinear due to the dependence of thermal and electrical conductivities on temperature [1]. Suggested solutions are based on the assumption of identity of equipotential and isothermal surfaces, which agree with experimental data [2] and valid for both linear and nonlinear cases. Well known Kohlrausch temperature-potential relation is analytically justified and agrees with [3-4].

Keywords: Thomson effect, symmetric and asymmetric electrical contacts

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