Computational algorithms for analysis of data from thin-film thermoresistors on a radio-electronic printed circuit board

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Abstract: In the paper, a printed circuit board with radio-electronic elements is considered as a geometrical structure with thin-film thermoresistors coated on to it. The local resistance of these thermoresistors depends on local temperature. The measurement of these resistances is carried out not in a local way but totally along horizontal or vertical lines. Therefore, the number of these total data on resistance is significantly less than the number of these local zones. During operating the printed circuit board, overheating of separate elements may occur that leads to a temperature increase of its corresponding parts and a resistance increase of separate parts of a chain. We set up the task of determining these areas of overheating and also their resistance and temperature being guided by some additional physical conditions.

Keywords: thin-film thermoresistors, radio-electronic printed circuit boards, local temperature, local resistance, numerical algorithms, underdetermined systems of linear algebraic equations

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References

[1] J.H. Wilkinson. The Algebraic Eigenvalue Problem. *A Clarendon Press Publication. Oxford.* (1988).