CALCULATION OF THERMAL FIELDS OF MASSIVE BODIES HEATED BY A RADIAL HEAT SOURCE IN THE THREE-DIMENSIONAL CASE

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In the mathematical modeling of technological processes of electroslag welding, laser welding, gas-flame hardening, and plasma processing of surfaces, there arises the problem of heating a semi-infinite body by a small source in the three-dimensional case. To find the fields of temperatures, cooling rates, temperature gradients, and heat fluxes, it is often necessary to investigate the areas directly adjacent to the heat source. An important issue is the distribution of the heat flux density over the heating surface, which can be very complex. There are virtually no examples of studying the solutions for an arbitrary distribution of the heat flux density. In this paper the problem is considered in the presence of a circular heat source.

Keywords: boundary value problems for partial differential equations, asymptotics of a solution.

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