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An iteration method for solving the problem of optimal nonlinear heating with phase constraints. (English. Russian original) [Zbl 1001.49031](#)
Comput. Math. Math. Phys. 40, No. 11, 1550-1566 (2000); translation from *Zh. Vychisl. Mat. Mat. Fiz.* 40, No. 11, 1615-1632 (2000).

This paper is devoted to a one-dimensional time optimal control problem of heating process with constraints imposed on tension and compression thermal stresses and maximal temperature. An iteration method of solution is suggested based on reducing the initial nonlinear problem to a sequence of infinite-dimensional time optimal control problems described by linear state equations with nonlinear constraints on phase variables. It is proved that the sequence of solutions to these linear equations converges in the state to the solution of the initial nonlinear equation.

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MSC:

- [49M25](#) Discrete approximations in optimal control
- [65M99](#) Numerical methods for partial differential equations, initial value and time-dependent initial-boundary value problems
- [80M50](#) Optimization problems in thermodynamics and heat transfer
- [35B37](#) PDE in connection with control problems (MSC2000)
- [80A17](#) Thermodynamics of continua
- [80M25](#) Other numerical methods (thermodynamics) (MSC2010)

Keywords:

heating process; optimal control problem; method of successive approximation; iteration; nonlinear phase constraints; convergence