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Protopopescu. *Optimal control of a time dependent thermistor problem.* Preliminary report.

An optimal control of a time dependent thermistor problem is considered. The problem is described by a system of two nonlinear partial differential equations coupled with appropriate boundary conditions which show how the thermistor is connected to its surroundings. Based on physical considerations, an objective functional to be minimized is introduced and the convective boundary coefficient is taken to be the control. Existence of the optimal control is proven. To characterize this optimal control, the optimality system consisting of the state and adjoint equations is derived. (Received September 19, 2007)