

1044-49-26

Volodymyr Hrynkiv* (hrynkivv@uhd.edu), Dept of Computer and Mathematical Sciences, University of Houston-Downtown, Houston, TX 77002, **Suzanne Lenhart** (lenhart@math.utk.edu), Department of Mathematics, University of Tennessee, Knoxville, TN 37996, and **Vladimir Protopopescu** (protopopesva@ornl.gov), Computational Sciences and Engineering Divisi, ORNL, Oak Ridge, TN 37831. *Optimal boundary control of a time dependent thermistor problem.*

An optimal control of a two dimensional time dependent thermistor problem is considered. The problem consists of two nonlinear partial differential equations coupled with appropriate boundary conditions which model the coupling of the thermistor 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 solutions to the state system and existence of the optimal control are proven. To characterize this optimal control, the optimality system consisting of the state and adjoint equations, is derived. (Received July 03, 2008)