1010-93-108 **Irina F. Sivergina*** (`isivergi@kettering.edu`), Department of Science and Mathematics, 1700 Third West Avenue, Flint, MN 48504, and **Michael P. Polis** (`polis@oakland.edu`). *A Null Controllability of a Quasi-Static Thermoelastic Plate.* Preliminary report.

We study the null controllability of the system

$$\begin{cases} (1+a^2)\theta_t = \Delta\theta + a\frac{d}{dt}\max\{a\int\limits_\Omega \theta(x,t)\,dx - g,\, 0\} + v(x,t), \\ \qquad\qquad\qquad\qquad x \in \Omega \subset R^n,\ t>0 \\ \theta(x,0) = \theta_0(x),\ \text{in } \Omega \\ \theta(x,t) = 0,\ \text{in } \Gamma_d \times (0,T) \\ \frac{\partial\theta(x,t)}{\partial\nu} = k(a\int\limits_\Omega \theta(x,t)\,dx - g)\theta(x,t),\ \text{in } \Gamma_c \times (0,T). \end{cases} \tag{1}$$

Here Ω is an open bounded domain in R^n with a piece-wise smooth boundary $\Gamma = \Gamma_d \cup \Gamma_c$, $k(s)$, $s \in R$, is a scalar nonnegative differentiable function, and $v(x,t)$ is regarded as a control.

Theorem. For any $\theta_0 \in H^1(\Omega)$, $\theta_0(x) = 0$ for $x \in \Gamma_d$, there is a control $v \in L^2(\Omega_T)$, $\Omega_T = \Omega \times (0,T)$, such that there exists a unique solution $\theta \in W^{2,1}(\Omega_T)$ to (1) and $\theta(\cdot,T) = 0$. Further, for any $\theta_0 \in L^2(\Omega)$ and any $\epsilon > 0$, there is a control $v \in L^2(\Omega_T)$, such that $\|\theta(\cdot,T)\| < \epsilon$. (Received August 22, 2005)