1067-35-1511 **Catherine G Lebiedzik*** (ar6554@wayne.edu), Department of Mathematics, 1150 Faculty/Administration Bldg., 656 W Kirby, Detroit, MI 48202. *The Optimal Interior Regularity for the Critical Case of a Clamped Thermoelastic System with Point Control.*

In the case of clamped thermoelastic systems with interior point control defined on a bounded domain Ω, the critical case is $n = \dim \Omega = 2$. Indeed, an optimal interior regularity theory was obtained by R. Triggiani for $n = 1$ and $n = 3$. However, in this reference, an 'ϵ-loss' of interior regularity has occurred due to a peculiar pathology: the incompatibility of the boundary conditions of the spaces $H_0^{\frac{3}{2}}(\Omega)$ and $H_{00}^{\frac{3}{2}}(\Omega)$. This problem for $n = 2$ was rectified in a follow-up paper which establishes the sought-after interior regularity of the thermoelastic problem through a technical analysis based on sharp *boundary* (trace) regularity theory of Kirchhoff and wave equations. As an additional bonus, a sharp boundary regularity of the elastic displacement is also obtained. In the present paper, we revisit that problem using a technique developed in the context of structural acoustic systems to circumvent the pathology of the incompatable boundary conditions. This yields a more direct proof of the optimal interior regularity (but not of the boundary regularity). (Received September 21, 2010)