1035-Z1-1718 **Richard J. Marchand*** (richard.marchand@sru.edu), Department of Mathematics, 229 Vincent Science Hall, Slippery Rock, PA 16057. *Comparing Mechanical and Thermal Damping in Elastic Beams.* Preliminary report.

The vibrations of a 1-dimensional thermoelastic beam are modeled by a system of partial differential equations involving two functions: one that describes the vertical displacement of the beam and another describing its temperature. It has recently been shown that the vibrations of the beam can be uniformly stabilized using the thermal properties of the beam or by applying mechanical damping to its boundary. The purpose of this talk is to provide a comparison of the effectiveness of the two different forms of damping. To this end, an analysis of the eigenvalues of the associated systems will be presented. In the absence of mechanical damping, the beam model can be solved using a nonstandard separation of variables approach, but in the case of mechanical damping, the eigenvalues are approximated numerically using a finite element method. This work provides the foundation for future research involving thermoelastic plates and shells with numerous applications in electromagnetic devices and aerospace engineering. (Received September 20, 2007)