1056-93-675   **Scott W. Hansen*** (`shansen@iastate.edu`), Department of Mathematics, Iowa State University, Ames, IA 50011. *Stability and stabilization of a multilayer beam system.*

We consider the multi-layer Rao-Nakra beam system with combinations of passive internal damping and boundary feedback. With passive internal damping alone, we can prove that the system is exponentially stable except in two exceptional cases: when all the wave speeds are the same, or when all wave speeds except one are the same and the common wave speeds match one of a sequence of critical numbers. In these cases, a single feedback on one layer is sufficient to achieve exponential stability. Related results on boundary stabilization without any internal damping are also described. (Received September 15, 2009)