

Asymptotic stability of an Euler-Bernoulli beam with a nonlinear control system

Abstract. We investigate an Euler-Bernoulli beam which is coupled to a nonlinear system of ODEs via the boundary values of the free end. First, the problem is formulated as an evolution equation in an appropriate Hilbert space. A small modification of the total energy of the beam yields a Lyapunov function. After characterizing the possible ω -limit set, we can show the precompactness of the trajectories generated by the evolution equation. Combining these ingredients we finally show that all solutions converge to the zero solution for large times.

See [1] for the corresponding linear model.

References

- [1] MILETIC, M., AND ARNOLD, A. Euler-Bernoulli beam with boundary control: Stability and FEM. *PAMM* 11, 1 (2011), 681–682.