

Non-linear thermo-elastic system

Patricia Hilario Tacuri
Universidade Federal Fluminense, Brazil

Abstract. The main purpose for this work is to make a qualitative analysis of weak and strong global solutions for a beam setter taking into account the effect of fluctuations in temperature, We are interested to show theoretical aspects of a mix problem associated to non-linear thermo-elastic system, given by

$$\left\{ \begin{array}{l} u_{tt} - M \left(\int_0^L |u_x(t)|^2 dx \right) u_{xx} + u_{xxxx} + \theta_x + u_t = 0 \text{ em } Q, \\ \theta_t - \theta_{xx} + u_{xt} = 0 \text{ em } Q, \end{array} \right. \quad (1)$$

where $Q =]0, L[\times]0, T[$ com $L > 0$ e $T > 0$. We are going to establish an existence and uniqueness of the weak solution by the Faedo - Galerkin Method and compactness. Moreover, we will establish the exponential decay for the total energy to the system.