

Approximation of the controls for the beam equation with vanishing viscosity

Ionel Roventa (University of Craiova)

We study the uniform controllability property and the convergence of a finite difference semi-discrete scheme for the approximation of the boundary controls of a 1-d equation modeling the transversal vibrations of a hinged beam.

It is known that, due to the high frequency numerical spurious oscillations, the uniform (with respect to the mesh-size) controllability property of the semi-discrete model fails in the natural setting. Consequently, the convergence of the approximate controls corresponding to initial data in the finite energy space cannot be guaranteed.

We prove that, by adding a vanishing numerical viscosity, the uniform controllability property and the convergence of the scheme is ensured. Some numerical experiments which confirm the results are discussed.