Asymptotic behavior for a class of semilinear viscoelastic Kirchhoff plate models

Marcio Jorge da Silva[*][†]

Department of Mathematics, State University of Londrina, Londrina, Brazil.

Abstract. In this talk we present some new results on a class of semilinear viscoelastic equation related to N-dimensional Kirchhoff plate models, see for instance [2, 4, 5]. A breaf justification of the 2-dimensional model is considered by following classical constitutive laws in elasticity and viscoelasticity, as proposed in [1, 3, 6]. Then, some results on well-posedness and long-time dynamics of solutions to the history case (see [2]) as well as some results on general stability of the energy corresponding to the historyless case (see [4, 5]) are considered.

References

[1] I. Chueshov and I. Lasiecka, Global attractors for Mindlin-Timoshenko plates and for their Kirchhoff limits, Milan J. Math. 74 (2006) 117-138.

[2] B. Feng, H. A. Caixeta, M. A. Jorge Silva, Long-time behavior for a class of semi-linear viscoelastic Kirchhoff beam/plates, Appl. Math. Optim. (2018),
DOI: 10.1007/s00245-018-9544-3 (online published)

[3] C. Giorgi and F. Vegni, Uniform energy estimates for a semilinear evolution equation of the Mindlin-Timoshenko beam with memory, Math. Comput. Modelling 39 (2004) 1005-1021.

[4] E. H. Gomes Tavares, M. A. Jorge Silva, T.F. Ma, Sharp decay rates for a class of nonlinear viscoelastic plate models. Comm. in Contemp. Math. 20 (2018), p. 1750010.

[5] M. A. Jorge Silva, J. E. Muñoz Rivera, R. Racke, On a class of nonlinear viscoelastic Kirchhoff plates: well-posedness and generay decay rates. Appl. Math. Optim. 73 (2016), 165-194.

[6] J. E. Lagnese, Boundary Stabilization of Thin Plates. SIAM Studies in Applied Mathematics, vol. 10, Society for Industrial and Applied Mathematics (SIAM), Philadelphia, 1989.