

## Seminário de Equações Diferenciais Parciais

Decay Rates for Damped IBq-Beam Equations on the 1-D half line.

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Local: Sala 302

Resumo: We consider the mixed problem for weakly damped IBQ-Beam equations on the one dimensional half line  $(0, +\infty)$ . We shall derive fast decay results of the total energy and  $L^2$ -norm of solutions based on the idea due to [1] which is an essential modification of that developed by Morawetz [2]. In order to apply that idea due to [2] to the one dimensional exterior mixed problem, one also constructs an important Hardy type inequality, which holds only in the case of 1-D half line.

### Referências

- [1] R. Ikehata and T. Matsuyama,  $L^2$ -behaviour of solutions to the linear heat and wave equations in exterior domains, *Sci. Math. Japon.* 55 (2002), 33-42.
- [2] C. Morawetz, The decay of solutions of the exterior initial-boundary value problem for the wave equation, *Comm. Pure Appl. Math.* 14 (1961), 561-568.
- [3] S. Wang and H. Xue, Global solution for a generalized Boussinesq equation, *Applied Math. and Computation*, 204 (2008), 130-136.
- [4] C. R. da Luz and R. Coimbra Charão, *Asymptotic properties for a semilinear plate equation in unbounded domains*, *J. Hyperbolic Diff. Eqns.* 6 (2009), no. 2, 269–294.
- [5] R. C. Charo, Cleverson ER. Da Luz, R. Ikehata, New decay rates for a problem of plate dynamics with fractional damping, *Journal of Hyperbolic Differential Equations* 10 (2013), 113.