

SEMINÁRIO DE ANÁLISE

Dynamics of wave equations with degenerate memory

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Abstract. This paper is concerned with the long-time dynamics of a semilinear wave equation with degenerate viscoelasticity

$$u_{tt} - \Delta u + \int_{-\infty}^t g(t-s) \operatorname{div}[a(x)\nabla u(s)] ds + f(u) = h(x),$$

defined in a bounded domain Ω of \mathbb{R}^3 , with Dirichlet boundary condition and nonlinear forcing $f(u)$ with critical growth. The problem is degenerate in the sense that the function $a(x) \geq 0$ in the memory term is allowed to vanish in a part of $\bar{\Omega}$. When $a(x)$ does not degenerate and g decays exponentially it is well-known that the corresponding dynamical system has a global attractor without any extra dissipation. In the present work we consider the degenerate case and prove the existence of global attractors by adding a complementary frictional damping $b(x)u_t$, which is in certain sense arbitrarily small, such that $a + b > 0$ in $\bar{\Omega}$.

Referências

- [1] M. M. Cavalcanti, L. H. Fatori and T. F. Ma, J. Differential Equations 260 (2016) 56-83.
- [2] M. M. Cavalcanti and H. Portillo-Oquendo, SIAM J. Control Optim. 42 (2003) 1310-1324.