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SEMINÁRIO DE ANÁLISE E EQUAÇÕES DIFERENCIAIS

Dia 29 de Junho (quinta-feira), às 13h30, sala 6.2.33

Quantization of energy and weakly turbulent profiles for some dissipative wave equations

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Abstract: We consider a second order equation with a linear "elastic" part and a nonlinear damping term involving the spatial integral of the square of the velocity: $u''(t) + |u'(t)|^2 u'(t) + Au(t) = 0$. We investigate the asymptotic behavior of solutions, after rescaling them suitably in order to take account of the decay rate and bound their energy away from zero. It turns out that solutions with finitely many non-trivial Fourier components are asymptotic to solutions of the linear equation without damping, and exhibit some sort of equipartition of the energy among the components. Solutions with infinitely many Fourier components tend to zero weakly but not strongly. We show also that the limit of the energy of solutions depends only on the number of their non-trivial Fourier components. The idea of the proofs is based on comparison with a simplified model devised through an averaging procedure.

Seminário financiado por Fundos Nacionais através da FCT – Fundação para a Ciência e a Tecnologia no âmbito do projeto UID/MAT/04561/2013

Local: FCUL – Edf. C6 - Piso 2, 6.2.33