WORKING GROUPS PDE

DATE: TUESDAY, MAY 8, STARTING FROM 15:30 [1]

Decay rates of magneto/elasticity waves in exterior domains

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We study a dynamic system of equations motivated by the propagation of elastic waves in the presence of a magnetic field. Such models where already described in the work of L. Knopoff (1955), J. Dunkin and A. Eringen (1963) and W.Nowacki (1979) among others. In recent years several contributions obtained further properties of the solutions of such models. For example, the long time behavior of the energy for large time.This was done in bounded domains. In this lecture we will consider the same model (of magnetoelastic waves) in exterior domains with a localized damping near infinity. We used convenient modified multipliers and obtain as a final result that the total energy associated with the model decays like 1/t for large time. This is a work in Collaboration with R.Charao and J.Oliveira.

REFERENCES:

1. A. Andreou and G. Dassios, Quarterly of Applied Mathematicas, 55, (1997), 23-39
2. R. Charao, G. Perla Menzala and J. Rivera, Discrete and Continuous Dynamical Systems, Serei A ,Vol. 25 ,(2009) 797-821
3. G. Perla Menzala and E. Zuazua ,Asymptotic Analysis 18, (1998), 349-362
4. R. Racke and J. Rivera , Advances in Differentia Equations, 6, (2001), 359-384

A penalization and regularization technique in shape optimization problems in arbitrary dimension

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We discuss optimal layout problems and general shape optimization problems governed by elliptic equations with Dirichlet boundary conditions. In both cases a fixed domain formulation is introduced based on penalization/regularization techniques. Approximation properties and some error estimates are investigated. The finite element discretization and some numerical experiments are indicated as well.

[1] The presentation will last about 30 minutes + further questions and discussions