Seminario de Análisis y Aplicaciones

Viernes 24 de Marzo 2023,

12:00-13:00, Aula 520, Módulo 17

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Dimension reduction for magnetoelastic plates

Resumen:
We investigate the problem of dimension reduction for plates in magnetoelasticity. The model features a mixed Eulerian-Lagrangian formulation, as magnetizations are defined on the deformed set in the actual space. We consider low-energy configurations by rescaling the elastic energy according to the linearized von Kármán regime.

First, we identify a reduced two-dimensional model by computing the Γ-limit of the magnetoelastic energy, as the thickness of the plate goes to zero. Then, we introduce applied loads given by mechanical forces and external magnetic fields, and we prove that sequences of (almost) minimizers of the total energy converge to minimizers of the corresponding energy in the reduced model. Finally, we study quasistatic evolutions within the framework of rate-independent processes, and we provide a further justification of the reduced model in the spirit of evolutionary Γ-convergence.

This talk is partly based on joint work with Martin Kružík (Czech Academy of Sciences).

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