> Seminario de Matemática Aplicada

DEPARTAMENTO DE MATEMÁTICA APLICADA

Pablo Venegas

GIMNAP, Departamento de Matemática,
Universidad del Bío-Bío, Chile

Optimizing the Kelvin Force in a Moving Target Subdomain

In order to generate a desired Kelvin (magnetic) force in a target subdomain moving along a prescribed trajectory, we propose a minimization problem with a tracking type cost functional. We use the so-called dipole approximation to realize the magnetic field, where the location and the direction of the magnetic sources are assumed to be fixed. The magnetic field intensity acts as the control and exhibits limiting pointwise constraints. We address two specific problems: the first one corresponds to a fixed final time whereas the second one deals with an unknown force to minimize the final time. We prove existence of solutions and deduce local uniqueness provided that a second order sufficient condition is valid. We use the classical backward Euler scheme for time discretization. For the first problem we prove the convergence of this semi-discrete numerical scheme using Γ- convergence. We report computational results to assess the performance of the numerical methods. As an application, we study the control of magnetic nanoparticles as those used in magnetic drug delivery, where the optimized Kelvin force is used to transport the drug to a desired location.

Fecha	**Jueves, 26 de enero de 2017**
Lugar	**Aula Magna Facultad de Matemáticas** **Se podrá seguir por videoconferencia desde el Campus de Lugo**
Hora	**12:00**
Idioma	**Castellano**

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