



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.

Data	Xoves, 26 de xaneiro de 2017
Lugar	Aula Magna - Facultade de Matemáticas Poderase seguir por videoconferencia dende o Campus de Lugo
Hora	12:00
Idioma	Castelán

