CMM
Center for
Mathematical
Modeling

cmm.uchile.cl

Beauchef 851, Edificio Norte, piso 7
Santiago, CHILE
CP 837 0456

tel +56 2 2978 4870

SIPo (Seminario de Investigadores Postdoctorales)

Speaker: Jorge Aguayo (CMM)

Title: New developments in the study of the elasticity equation for the analysis of inverse problems applied in Geoscience.

Abstract:

This talk presents the analysis of an elasticity equation with interface conditions as a way to understand the formation of subduction earthquakes and how it is possible to determine geophysical characteristics of some tectonic plates from surface measurements.

First, two different numerical methods based on finite elements are analyzed to solve the forward problem by comparing their algorithmic complexity and some properties necessary to solve an inverse problem. Then, the inverse problem of recovering the coseismic slip (one of the interface conditions) from surface measurements of deformations and tractions is analyzed, presenting a conditional stability result. Finally, we present an optimal control problem that allow us to recover a good approximation of the coseismic slip and the numerical analysis associated with the solution to the discretized optimal control problem. This talk will be complemented with some numerical experiments that show the efficiency of our numerical solvers and some realistic synthetic examples that simulate a subduction earthquake on the coast of Chile.

Date: 1st July 2024, Monday at 2.30PM
Venue: John Von Neumann Seminar Room, CMM, Beauchef 851, North Tower, 7th Floor