Seminarios Problemas Inversos y de Control (UCh-PUC-USM-USACH)

Fecha: Miércoles 19 de Noviembre 2014 Lugar: Sala de Seminarios CMM, 7mo piso, Beauchef 851, Torre norte Hora: $14h00 - 16h00$ (2 seminarios)

1.– **Nicole Spillane Postdoc Conicyt-DIM/CMM PhD U. Paris** 62014 **Achieving Robustness in Domain Decomposition Algorithms**

Domain decomposition methods are a family of algorithms which allow to solve large scale problems on parallel architectures. I will introduce the main idea behind domain decomposition which is to approximate the solution of a very large problem using solutions to smaller problems and illustrate it by presenting some of the popular domain decomposition methods (Schwarz, BDD, FETI). Although the field is already quite mature most domain decomposition methods do not perform as well as expected when simulating real life problems. One well known challenge is the case where the simulated medium is heterogeneous. For example a tire is made of rubber and steel, two materials with very different behavior laws, and this slows convergence down considerably. One way to improve convergence is to introduce an additional problem which is shared between all subdomains: the coarse problem. It is the restriction of the original problem to a coarse space. This coarse space should be small enough that the coarse problem can be solved easily and at the same time contain enough relevant information on the problem to accelerate convergence. For three popular domain decomposition methods (Schwarz, BDD, FETI) we have devised a new method to build the coarse space using generalized eigenvalue problems on each subdomain. Because the choice of the eigenvalue problem stems directly from the theoretical convergence proof it allows to achieve any targeted convergence rate. We will illustrate the way this works on toy problems and also provide large scale numerical results which point toward scalability and overall efficiency. This is joint work with: V. Dolean, P. Hauret, P. Jolivet, F. Nataf, C. Pechstein, D. J. Rixen and R. Scheichl.

2.– **Nicol´as Carreño Postdoc Conicyt-UTFSM PhD U. Paris** 62014 **On the cost of null controllability of a linear KdV equation**

In this talk, we consider a linear Korteweg-de Vries (KdV) equation with a transport term posed on a finite interval. The control is located on the left endpoint of the interval, and on the right we have homogeneous conditions on the first and second derivatives. We will present some results concerning the behaviour of the cost of null controllability with respect to the dispersion coefficient. In particular, for any final time we prove that this quantity grows exponentially as the dispersion coefficient vanishes, which differs from previous similar works.

Miércoles 19 de noviembre a las 14 : 00 hrs. Sala de Seminarios John Von Neumann.