Seminario HUBERT MENNICKENT *de Matemática Aplicada*

"Creando y difundiendo Matemática y sus Aplicaciones"

Expositor:

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Título de la Charla:

On convection-diffusion-reaction and transport-flow problems modelling sedimentation

Fecha y Hora:

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Lugar:

Auditorio Alamiro Robledo, FCFM
Universidad de Concepción

Resumen:

The sedimentation of a suspension is a unit operation widely used in mineral processing, chemical engineering, wastewater treatment, and other industrial applications. Mathematical models that describe these processes and may be employed for simulation, design and control are usually given as nonlinear, time-dependent partial differential equations that in one space dimension include strongly degenerate convection-diffusion-reaction equations with discontinuous coefficients, and in two or more dimensions, coupled flow-transport problems. These models incorporate non-standard properties that have motivated original research in applied mathematics and numerical analysis. This contribution summarizes recent advances, and presents original numerical results, for three different topics of research: a novel method of flux identification for a scalar conservation law from observation of curved shock trajectories that can be observed in sedimentation in a cone; a new description of continuous sedimentation with reactions including transport and reactions of biological components; and the numerical solution of a multidimensional sedimentation-consolidation system by an augmented mixed-primal method, including an a posteriori error estimation.

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