



SEMINARIO DE ANÁLISIS NUMÉRICO DE ECUACIONES DIFERENCIALES PARCIALES.

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Título de la Charla:

***A stabilized finite volume element methods
for sedimentation-consolidation processes***

Fecha y Hora:

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Lugar:

Auditorio Alamiro Robledo, FCFM, Universidad de Concepción.

Resumen

A model of sedimentation-consolidation processes in so-called clarifier-thickener units is given by a parabolic equation describing the evolution of the local solids concentration coupled with a version of the Stokes system for an incompressible fluid describing the motion of the mixture. In cylindrical coordinates, and if an axially symmetric solution is assumed, the original problem reduces to two space dimensions. This poses the difficulty that the subspaces for the construction of a numerical scheme involve weighted Sobolev spaces. A novel finite volume element method is introduced for the spatial discretization, where the velocity field and the solids concentration are discretized on two different dual meshes. The method is based on a stabilized discontinuous Galerkin formulation for the concentration field, and a multiscale stabilized pair of \mathbb{P}_1 - \mathbb{P}_1 elements for velocity and pressure, respectively. Numerical experiments illustrate properties of the model and the satisfactory performance of the proposed method.

This presentation is based on joint work with Ricardo Ruiz-Baier (EPFL Lausanne) and Héctor Torres (Universidad de La Serena).

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