Seminario SANMOMA-GRADUADOS

Centro de Investigación en Ingeniería Matemática, CI^{2}MA, UDEC

Expositor:

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Título de la charla:

Error analysis of a conforming and locking-free four-field formulation in poroelasticity

Lugar:

Hall del CI^{2}MA

Fecha:

Miércoles 4 de Septiembre. 15:30 Horas

Resumen

In this talk we present an *a priori* and *a posteriori* error analysis of a conforming finite element method for a four-field formulation of Biot's consolidation model. For the *a priori* error analysis we provide suitable hypotheses on the corresponding finite dimensional subspaces ensuring that the associated Galerkin scheme is well-posed. We show that a suitable choice of subspaces is given by the Raviart–Thomas elements of order $k \geq 0$ for the fluid flux, discontinuous polynomials of degree k for the fluid pressure, and any stable pair of Stokes elements for the solid displacements and total pressure. Next, we develop a reliable and efficient residual-based *a posteriori* error estimator. Both the reliability and efficiency estimates are shown to be independent of the modulus of dilatation. Numerical examples in 2D and 3D verify our analysis and illustrate the performance of the proposed *a posteriori* error indicator.

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