Seminario de Análisis Numérico de Ecuaciones Diferenciales Parciales

Departamento de Matemática, UBB
Centro de Investigación en Ingeniería Matemática (CI^{2}MA), UDEC

Expositor:

Norbert Heuer

Facultad de Matemática, Pontificia Universidad Católica de Chile.

Título de la Charla:

Robust discontinuous Petrov-Galerkin method for convection-dominated diffusion problems

Fecha y Hora:

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Lugar:

Auditorio Alamiro Robledo, FCFM, Universidad de Concepción.

Resumen

We analyze the discontinuous Petrov-Galerkin method for the solution of convection-dominated diffusion problems in two and three dimensions. Choosing appropriate test functions, the method is known to converge optimally in the corresponding energy norm. The aim of this talk is to present a setting which delivers robust L^2 error estimates for the field variables, and which are quasi-optimal in the energy norm. Key feature of the method is to construct test functions defined by a variational formulation with bilinear form (test norm) specifically designed for the goal of robustness. Main theoretical ingredient is a stability analysis of the adjoint problem. Numerical experiments underline our theoretical results and, in particular, confirm robustness of the DPG method for well-chosen test norms.

This talk is based on joint work with Leszek Demkowicz (ICES, The University of Texas at Austin, USA).

Informaciones: royarzua@ubiobio.cl y dmora@ubiobio.cl