SEMINARIO DE ANÁLISIS NUMÉRICO Y MODELACIÓN MATEMÁTICA

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Título de la Charla:

Discontinuous approximations of hypersingular integral equations

Fecha y Hora:

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Lugar:

Auditorio Alamiro Robledo, FCFM

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Resumen

Standard finite element error analysis for elliptic problems is based on the Cea and Bramble-Hilbert lemmas in combination with transformation properties of Sobolev norms. Boundary element analysis is no different in this respect, main additional ingredients are the mapping properties of boundary integral operators. In this talk we will review the analytical difficulties that arise (or not) when making the step from finite elements to boundary elements or, more generally, when reducing the order of the involved Sobolev spaces by one half. We start with reviewing standard arguments for conforming methods. Afterwards we discuss some problems in detail that appear when switching to non-conforming approaches, on the element level and a sub-domain level. It turns out that (discrete) ellipticity is rather straightforward to achieve whereas continuity, of the type needed for error estimation, is more involved. As illustration we present theoretical and (in some cases) numerical results for boundary elements of Crouzeix-Raviart type, with Lagrangian multipliers, two domain decomposition methods with non-conforming meshes, and discontinuous Galerkin boundary elements.

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