SEMINARIO

Adérito Araújo

CMUC, University of Coimbra (Portugal)

Optimal error estimates for a discontinuous Galerkin method on curved boundaries

Abstract: We consider a discontinuous Galerkin method for the numerical solution of boundary value problems in two-dimensional domains with curved boundaries. A key challenge in this setting is the potential loss of convergence order due to approximating the physical domain by a polygonal mesh. Unless boundary conditions can be accurately transferred from the true boundary to the computational one, such geometric approximation errors generally lead to suboptimal convergence. To address this issue, we employ a higher-order strategy based on polynomial reconstruction of the boundary data. In this talk, we present error estimates for a two-dimensional linear advection–diffusion–reaction problem with homogeneous Dirichlet boundary conditions on both convex and non-convex domains. We show that, under suitable regularity assumptions on the exact solution, the DG-ROD method attains optimal convergence rates despite the polygonal approximation of the domain. Finally, we support the theoretical findings with numerical benchmarks.

Sala de Grados I, Facultad de Ciencias
Lunes 11 de Mayo de 2026 (17:00)
Organiza: G.I.R. MTANPOEE