PIMS / AMI Seminar

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CAB 657

"isogeometric Residual Minimization Method (iGRM)"

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Abstract

We propose a novel computational implicit method, which we call Isogeometric Residual Minimization (iGRM) with direction splitting. The method mixes the benefits resulting from isogeometric analysis, residual minimization, and alternating direction solver. Namely, we utilize tensor product B-spline basis functions in space, and alternating direction methods in time and space. We implement a semi-implicit time integration scheme and apply, for each space-direction, a stabilized mixed method based on residual minimization. We propose a preconditioned conjugate gradients method with a linear computational cost resulting from a Kronecker product structure of the system of linear equations. We test our method on two-dimensional simulations of an advection-diffusion stationary and time-dependent problems, as well as on model Stokes problem.

Collaborators:

Marcin Los (AGH, Krakow, Poland), Ignacio Muga (PCU, Valparaiso, Chile), Quanling Deng (Perth University, Western Australia), Victor Calo (Perth University, Western Australia)