



Numerical Analysis Seminar

A pressure-robust staggered DG method for the incompressible Navier-Stokes equations on polygonal meshes

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Abstract

In this talk, we will introduce a novel pressure-robust staggered discontinuous Galerkin method for the incompressible Navier-Stokes equations on general polygonal meshes. The devising of the method hinges on a carefully designed finite element pair and nonlinear convective term, which ensures pressure-robustness. The optimal convergence estimates for all the variables in L^2 norm are proved under a suitable smallness condition. In particular, the unique solvability and convergence error estimates are proved to be independent of the irrotational part of the source term. Then we will discuss the extension of the proposed scheme to solve the Boussinesq problem, which describes the dynamics of non-isothermal flows. Numerical experiments will be presented to validate the theoretical findings and demonstrate the superior performances of the proposed method especially for problems with high Reynolds number or zero velocity.

Date: September 28, 2021 (Tuesday)

Time: 4:00 - 5:00pm (Hong Kong Time)

Venue: Room 210, Run Run Shaw Bldg., HKU
and

ZOOM: <https://hku.zoom.us/j/>

Meeting ID: 913 6532 3891

Password: 310656



Attendance limited
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