A SDG method for the incompressible Navier-Stokes equations and its applications

ERIC CHUNG

Department of Mathematics, The Chinese University of Hong Kong

Email: tschung@math.cuhk.edu.hk

In this talk, we present a staggered discontinuous Galerkin method for the approximation of the incompressible Navier-Stokes equations. Our new method combines the advantages of discontinuous Galerkin methods and staggered meshes, and results in many good properties, namely local and global conservations, optimal convergence and superconvergence through the use of a local postprocessing technique. Another key feature is that our method provides a skew-symmetric discretization of the convection term, with the aim of giving a better conservation property compared with existing discretizations. We also analyze the stability and convergence of the method. In addition, we will present some numerical results to show the performance of the proposed method. This research is partially supported by the Hong Kong RGC General Research Fund (Project: 400813).