A staggered cell-centered DG method for the biharmonic problem on polygonal meshes

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In this poster, we present a staggered cell-centered discontinuous Galerkin (SDG) method for the biharmonic equation with the Steklov boundary condition based on the first order system. To apply SDG, we divide the primal meshes into the submeshes and form the dual meshes. The SDG method handles general polygonal, which enables us to treat hanging nodes and apply an adaptive mesh refinement efficiently. The a priori error analysis shows the optimal convergence for all the variables, and the superconvergence allows us to postprocess and construct a piecewise linear approximation of the main variable. Three residual-type a posteriori error estimators are derived to perform adaptive mesh refinements. The numerical results are provided to demonstrate that our method works well on the polygonal approximation of the curved domain.

References

[1] L. Zhao, E.-J. Park, and Wonjong Kim, **A staggered cell-centered DG method for the biharmonic Steklov problem on polygonal meshes : A priori and a posteriori analysis**, Comput. and Math. Appl., 117 (2022), pp. 216—228.