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High order approximation with the Virtual Element Method

Abstract:

The Virtual Element Method (VEM) is a very recent generalization of the Finite Element Method (FEM). VEM utilizes polygonal/polyhedral meshes in lieu of the classical triangular/tetrahedral and quadrilateral/hexahedral meshes. This automatically includes nonconvex elements, hanging nodes (enabling natural handling of interface problems with nonmatching grids), easy construction of adaptive meshes and efficient approximations of geometric data features.

In this talk we review the basic construction of the method and discuss an extension of VEM to

- * approximations of high order on quasiuniform polygonal grids (p-VEM) and
- * variable order approximations on geometrically refined polygonal grids (hp-VEM).

(Joint work with L. Mascotto, L. Beirao da Veiga, A. Russo)