Adaptive Virtual Element Method

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Abstract

The Virtual Element Method (VEM) is relatively new paradigm for the discretization of PDEs which allows for general polytopal meshes. This geometric flexibility is very useful in many engineering applications, in particular when adaptive mesh refinement is needed to enhance the quality of the approximate solution. In this respect, two crucial, but yet open, questions arise: (a) how to systematically refine general polytopes (and preserve geometric properties of the computational mesh)?; (b) how to design adaptive algorithms with provable convergence and optimal complexity properties?

In this talk, having in mind these two questions, we briefly review the state of the art of the research and discuss recent results on the study of the convergence and optimal complexity properties of an Adaptive Virtual Element Method (AVEM) for the solution of a second order elliptic problem in two dimensions. Finally, limitations and future developments of the presented results will be discussed.

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