NONCONFORMING VIRTUAL ELEMENT METHODS

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ABSTRACT. The Virtual Element Method (VEM) is an extension of the finite element method to polytopic meshes. Test and trial spaces are made up of functions that are solutions to local problems related to the PDE to be approximated. They generally contain polynomials of a given maximum degree, as well as nonpolynomial functions, which need not be explicitly known.

In order to impose conformity conditions in the global spaces, the local VEM spaces and their degrees of freedom are defined in such a way as to impose continuity either of the traces at interelement boundaries (conforming VEM), or of a certain number of moments at the mesh facets (nonconforming VEM). Unlike conforming VEM, nonconforming VEM can be presented in a unified framework for any dimension, which considerably simplifies its analysis and implementation.

In this talk, I will discuss a VEM discretization of the heat equation in a space-time variational formulation, highlighting the advantages of the nonconforming approach, particularly with regard to incompatible data and mesh adaptivity.

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