

QUANTITATIVE STUDY OF THE STABILIZATION PARAMETER IN THE VIRTUAL ELEMENT METHOD

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ABSTRACT. The choice of stabilization term is a critical component of the Virtual Element Method. However, the theory of VEM provides only asymptotic guidance for selecting the stabilization term, which ensures convergence as the mesh size approaches zero, but does not provide a unique prescription for its exact form.

In this paper, we establish a link between VEM and generalized barycentric coordinates, in particular isoparametric finite elements as a specific case. This connection enables the interpretation of the stability as the energy of a particular function in the discrete space, commonly known as the "hourglass mode". Through this approach, this study sheds light on how the virtual element solution depends on the stabilization term, providing insights into the behavior of the method in more general scenarios.

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