

A Posteriori Error Estimation of the Immersed Weak Galerkin Method for Parabolic Problems with Non-Smooth Coefficients

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Abstract

This talk aims to present a posteriori error estimation of the non-conforming immersed weak Galerkin (WG) method for parabolic problems with non-smooth coefficients, called the interface problems. These type of problems arise in a wide range of applications which includes fluid mechanics, materials science, biological sciences and many others. The key idea of the WG method is to approximate the underlying differential operator in the weak sense. We study a fully discrete scheme obtained by coupling the implicit backward Euler in time and the immersed WG method in space. Using the time-dependent Helmholtz decomposition of the error, we derive a reliable a posteriori error bound in the $L^2(H^1)$ -norm without directly relying on the energy argument. Numerical results are reported to validate the theoretical findings.