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Xu Zhang* (xzhang@okstate.edu), Stillwater, OK 74078, and **Cuiyu He** (cuiyu.he@uga.edu), Department of Mathematic, University of Georgia, Athens, 30602. *A posteriori error estimation of an immersed finite element method.*

Interface problems arise in many applications in science and engineering. Partial differential equations (PDEs) are often used to model interface problems. Solutions to these PDE interface problems often involves kinks, singularities, discontinuities, and other non-smooth behaviors. The immersed finite element method (IFEM) is a class of numerical methods for solving PDE interface problems with unfitted meshes. In this talk, we introduce a residual-based a posteriori error estimation for IFEM. We show that the error estimator is globally reliable and locally efficient, with the reliability and efficiency constants independent of the interface location. This error estimator can provide accurate assessment of the numerical approximation and can also be used as a guidance for adaptive mesh refinement for IFEM. Numerical results are provided to demonstrate the features of the adaptive IFEM. This is a joined work with Cuiyu He. (Received January 02, 2020)