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Xu Zhang*, 410 Allen Hal, 175 President's Circle, Mississippi State, MS 39762. *Superconvergence of Immersed Finite Element Methods.*

Immersed finite element method (IFEM) is a class of finite element methods (FEM) that can solve interface problems with unfitted meshes. Superconvergence is a phenomenon that the order of convergence at certain points is higher than the maximum order of convergence of numerical solutions. In this talk, we introduce some superconvergence properties of IFEM for one dimensional interface problems. The key step in our analysis is the construction of generalized orthogonal polynomials with discontinuous weight function. We will show that IFE functions perfectly fit into the framework of generalized orthogonal polynomials. Finally, we will demonstrate that IFE solutions inherit all desired superconvergence properties from standard FEM. This is a joint work with Waixiang Cao and Zhimin Zhang. (Received September 13, 2016)