Robust Recovery-Based a posteriori Error Estimators for Finite Element Methods

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School of Physical and Mathematical Sciences

The Zienkiewicz-Zhu (ZZ) a posteriori error error estimator, as an example of recovery-based error estimators, is extremely popular in the engineering community. But it is also well known that if we apply ZZ error estimator naively to complicated problems like elliptic interface equations, it will over-refine regions with small error and is not robust.

In this talk, by using the intrinsic continuities of the underlying problem and the properties of different finite element discretizations, we present a unifying framework for constructing robust recovery based error estimators. Different types of finite element approximations (conforming, mixed, nonconforming, and DG) and partial differential equations will be discussed.

Speaker Biography
Dr. Shun Zhang obtained his Ph.D. degree from Department of Mathematics of Purdue University in 2009 under the direction of Professor Zhiqiang Cai with a dissertation on error estimators of finite element methods. Currently, he is a postdoc at the Division of Applied Mathematics of Brown University, working with Professor Jan Hesthaven. His current research focuses on a posteriori error estimations, finite element methods, reduced basis methods, and multiscale methods. He was awarded the SIAM Student Paper Prize at the 2009 SIAM annual meeting.

Host: Division of Mathematical Sciences, School of Physical and Mathematical Sciences

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