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Seminar

Adaptivity and Online Basis Construction for Generalized Multiscale Finite Element Methods

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Abstract: Multiscale problems arise in many applications due to spatial and temporal variations of physical and chemical processes. Typical applications include flow in porous media, where the pore sizes can be much smaller compared to the size of the domain, e.g., the reservoir. One can consider various processes, such as flow, wave propagation, convection in these heterogeneous media. The use of standard simulation techniques requires resolving the small scales, which can be prohibitively expensive, and thus, there is a need for reduced-order models.

There are many model reduction techniques in the literature. Multiscale Finite Element Method (MsFEM) is one of the techniques which constructs local multiscale basis function to obtain a reduced-order model. In this talk, we will discuss a method called Generalized Multiscale Finite Element Method (GMsFEM) which follows the idea of MsFEM. GMsFEM gives a systematic way to construct the multiscale basis functions for each coarse block by solving local spectral problem. We will also present an adaptive basis enrichment and online basis construction technique for GMsFEM.

Date: 15 January 2016 (Friday)
Time: 3:30 p.m. – 4:30 p.m.
Venue: Room 219, Lady Shaw Building
The Chinese University of Hong Kong, Shatin

All are Welcome!