

Department of Mathematics
City University of Hong Kong

Colloquium

Organised by Prof. Tong YANG and Dr Xianpeng HU

Multiscale Model Reduction for Heterogeneous Problems

by

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Abstract :

In this talk, we present a reduced order model using the Generalized Multiscale Finite Element Method (GMsFEM). This method involves two basic steps: (1) the construction of multiscale basic functions that take into account small scale heterogeneities in the local domains and (2) the construction of the coarse scale approximation. For the construction of the multiscale basic functions, we solve spectral problems in local domains. Spectral problems help identifying the most important characteristics of the solution. In contrast to the available techniques, this method allows avoiding the limitations associated with idealization and limitations on the applicability of the method. This method also is more general technology that takes into account the different scale processes. The construction of basic functions occurs independently for each local domain, doesn't require the exchange of information between processors, and has a high parallelization efficiency. Using constructed multiscale basic functions, we construct a mathematical model on a coarse grid that allows significantly reducing the computation time, the amount of used memory, and can be used to perform calculations for a given configuration of heterogeneous properties. We will present several applied problems with different types of heterogeneities to illustrate the idea and the performance of our methods.

Date: 15 November 2017 (Wednesday)
Time: 4:10 – 4:50pm
Venue: 2201, Li Dak Sum Yip Yio Chin Academic Building
(AC2)
City University of Hong Kong

**** All interested are welcome ****

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