Model Reduction Techniques for Numerical Homogenization

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Many multiscale methods rely on the construction of localized basis or on local recovery of some macroscopic parameters to set up an efficient macroscopic scheme. In this talk we discuss the design and analysis of multiscale methods combined with reduced order modeling techniques such as the reduced basis method. We will present reduced basis numerical homogenization methods for quasilinear problems and Stokes problems with multiple scales. Multiscale reduced basis method for problems without scale separation based on local orthogonal decompositions will also be discussed. This talk is based upon a series of joint works with various collaborators (see the references below).

References:

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