A Preconditioned Low-rank Projection Method with a Rank-reduction scheme for Stochastic PDEs*

Kookjin Lee, University of Maryland

An efficient iterative solution algorithm for Parameterized PDEs

- Discretization: spectral stochastic finite element method $\rightarrow$ a large coupled linear system
- Solver: a two-level method,

  coarse-grid computation $\rightarrow$ fine-grid computation

  - On a coarse-spatial grid: identify an important subspace of the parameter domain
  - On a fine-spatial grid: compute a low-rank approximation using a tensor variant of GMRES combined with a rank-reduction scheme using the coarse-grid information

* Joint Work with Howard C. Elman