Numerical Strategies for the Galerkin-Proper Generalized Decomposition Method

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Abstract

The Proper Generalized Decomposition [1, 5] or, in short, PGD is a technique that reduces calculation and storage cost drastically and presents some similarities with the Proper Orthogonal Decomposition, in short POD. The PGD is a tensor decomposition [4] based methodology. We remark that the use of tensor product approximations is also receiving a growing interest in numerical analysis for the solution of problems defined in high-dimensional tensor spaces, such as PDEs arising in stochastic calculus [1, 3] (e.g., Fokker-Planck equation). In this work, we propose a PGD-Galerkin methodology based in the algorithm given in [2]. Also we test different numerical strategies to improve the convergence towards a solution of the associated Galerkin problem.

References

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