

High-dimensionality, Uncertainty Quantification and Scientific Computing

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Uncertainty quantification (UQ) has recently gained an increasing amount of attention in scientific computing community and is a fundamental challenge in numerical simulations of many physical/engineering problems. We introduce uncertainty quantification and discuss some of the recently developed UQ methods such as generalized polynomial chaos (gPC) and how to deal with high-dimensional problem inherent in complex problems.

We also present numerical examples to illustrate the proposed methods.