A semi-intrusive Code Framework for Uncertainty Quantification

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Abstract

Standard methods for quantifying the effects of uncertainties in hyperbolic problems can yield oscillatory solution approximations. ...

Keywords: conservation laws, hyperbolic, intrusive, UQ, IPM, SG, Collocation

1. Introduction

2. Methods of Uncertainty Quantification

2.1. Collocation

2.2. Stochastic Galerkin

2.3. Intrusive Polynomial Moment Method

3. Method discussion

- kleinere Fehler [11]

- Programmieraufwand [31]

- zweiabhängig

- adaptiv (breack up black box approach)

- grobe Auflösung für Momente

4. UQCreator

4.1. Adaptivity

4.2. restart IPM

4.3. one-shot IPM

4.4. adaptive IPM

5. Results

5.1. 2D Euler flow over NACA0012

- AoA study

- AoA + Ma number + mehr ?

5.2. 2D shallow water dam break