Contribution ID: **70** Type: **Talk**

A reduced basis method for parabolic PDEs based on a least squares space-time formulation

Wednesday 19 February 2025 09:45 (45 minutes)

We propose a least-squares formulation for parabolic PDEs in the natural $L^2(0,T;V^*) \times H$ norm which avoids regularity assumptions on the data of the problem, which e.g. appear in the recently proposed First Order System Least Squares (FOSLS) method. For abstract parabolic equations the resulting bilinear form then is symmetric, continuous, and coercive. This among other things paves the ground for classical space-time a priori and a posteriori Galerkin frameworks for the numerical approximation of this problem class.

The approach is applicable for parameterized parabolic equations as well and we introduce a model order reduction technique that takes over all advantages from well-known elliptic settings. We introduce a POD-greedy method in some space-time energy norm at hand with absolute and relative error bounds. Numerical examples illustrate the performance of the method.

This is joint work with Christian Kahle and Michael Stahl from the University of Koblenz.

Primary author: HINZE, Michael (Universitat Koblenz)

Presenter: HINZE, Michael (Universitat Koblenz)

Session Classification: Plenary talk