

HIERARCHICAL REDUCED BASIS METHODS

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Keywords: *Reduced Basis Methods, hierarchical error estimator*

In this talk, we are considered with two aspects of hierarchical structures within the Reduced Basis Methods (RBMs): 1) Error estimates, 2) Treatment of parameter functions, in particular w.r.t. UQ.

Ad 1): Typical RB error estimates are based upon the residual and the (inverse of the) inf-sup constant, e.g. [2, 4]. This approach, however, may have some deficiencies. We present an approach using a hierarchical error estimator which is given by the difference of two RB approaches. We discuss both theoretical and practical aspects, [1].

Ad 2): Parameter functions have so far been studied for the RBM if they appear as initial condition for a parabolic problem. This approach, however, does not work when data is given e.g. as a time series. We present a new approach based upon a suitable wavelet decomposition of the data in combination with a local update of the RB approximation, [3].

This talk is based upon joint work with M. Ohlberger (Münster), S. Hain and M. Radic (Ulm).

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