

# Model reduction for parameter dependent and stochastic problems

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Parameter dependent problems – one variant of which are stochastic problems – posed in the form of partial differential equations lead upon discretisation to very high-dimensional problems. For many computations it would therefore be advantageous to reduce the model complexity.

The problems alluded to are naturally posed in tensor product spaces, and this property is used here in the model reduction process. Our aim is to determine the model reduction while we compute the solution. The ultimate goal is to actually reduce the model input, operate on the reduced model, and only compute a solution in a reduced format.

The next question is of course which properties of the full model we want conserved by the reduced model – i. e. what is it we consider important? Often this is represented by functionals of the solution. In that case error estimation is possible by adjoint methods through the use of dual weighted residual error estimators.