

# OPTIMAL EXPERIMENTAL DESIGN FOR UNCERTAINTY REDUCTION

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The goal of optimal experimental design (OED) [1] is to improve the prediction of model parameters by an appropriate choice of the design (setup) of the experiments. Its aim is therefore to increase the confidence level of the model calibration and consequently of the prediction simulations.

In the last decades the application of OED has been extended to various fields, which comprehend also the use of complex models based on differential equations [2]. We present a numerical method to solve OED problems in case of finite dimensional and also distributed parameters of models based on partial differential equations. In this context we present a numerical approach to the optimization of the design based on an adaptive finite element method for the solution of the state equation and the sensitivity equations needed to calculate the covariance matrix of the parameters. The adaptive algorithm is based on a matrix free approach and a goal oriented a-posteriori error estimation [3], for which the goal functional is the objective functional of the OED problem.

## REFERENCES

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