# Bayesian parameter calibration using surrogate models

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**ABSTRACT**

This talk discusses the inference of physical parameters using model surrogates. Attention is focused on the use of sampling schemes to build suitable representations of the dependence of the model response on uncertain input data. Non-intrusive regularized regressions are used for this purpose. A Bayesian inference formalism is then applied to update the uncertain inputs based on available measurements or observations. To perform the update, we consider two alternative approaches, based on the application of Markov Chain Monte Carlo methods or of adjoint-based optimization techniques. We illustrate the implementation of these techniques to calibrate wind drag parametrization in an ocean general circulation model, and to infer chemical rate parameters in shock tube experiments.