Dennis Beermann
Universität Konstanz

POD-based model order reduction in multiobjective optimal control techniques

In most optimal control problems, the cost function contains two components: The cost of the energy used to control the system and a defect of the state variable against a desired target. While these terms are often summed up using weighting factors, the talk will introduce concepts from multiobjective optimization to compute the Pareto front - a set of optimal compromises between the two. The hereby increased computational effort is countered using Proper Orthogonal Decomposition (POD) to reduce the dimension of state and adjoint equations. Two multiobjective strategies will be introduced: The reference point method to deal with high-dimensional control spaces and a set-oriented method for a high number of objective functions. Rigorous and heuristic error estimators are used to track the quality of the current reduced-order model.__