

Reducing the irreducible: model reduction for transport-dominated problems

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Short Description

Many applications in engineering require the repeated fast and accurate numerical solution of parametrized partial differential equations, e.g., in design optimization and uncertainty quantification. In the interest of making a many-query setting feasible, model order reduction (MOR) is a promising framework, whose main goal is the reduction of the computational cost of the numerical simulations. In the last decade, transport-dominated problems, arising, e.g., in the modeling of waves and shocks in fluids, have been shown to provide notable difficulties for “standard” MOR methods. This is because these problems have bad approximability properties, as encoded, e.g., in slowly decaying Kolmogorov n -widths. The purpose of this minisymposium is to collect the most recent results, as well as to provide a platform for the exchange of new concepts and ideas in MOR for transport-dominated problems.