

Model Order Reduction of Energy Networks with a Focus on Hyperbolic Systems

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The energy supply networks such as the gas pipeline network or the electric power grid are complex systems, whose dynamical behavior is becoming more and more of interest as the generation of power changes to be more decentralized and the consumers use more and more smart applications. In various parts of the simulation, control and optimization of these systems complexity reduction is needed. Several algorithms within this framework will be presented with one focus of the talk being the challenge of model order reduction for hyperbolic systems. (The gas flow within a pipeline is described by a hyperbolic partial differential equation, which leads to a mathematical description of the network system that still has a hyperbolic character.)