

The Loewner Framework for Model Reduction of Flow Equations

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The Loewner framework is an interpolatory model reduction approach which, in contrast to other approaches, computes a reduced order model (ROM) directly from data. This talk discusses an extension of the Loewner framework to semi-discretizations of fluid flow problems such as Burgers' equation or the Navier-Stokes equations. The extension addresses behavior of the transfer function at infinity, quadratic nonlinearity of the flow equations, and stability of the ROM. Numerical results illustrate the potential of the Loewner framework, but also expose additional issues that need to be addressed to make it fully applicable. Possible approaches to deal with some of these issues are outlined.