Reduced-Order Compensators via Interpolatory Model Reduction

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Abstract Feedback control of fluids is often achieved with limited state measurements. Effective approaches utilize compensators, which can be computed using linear quadratic Gaussian (LQG) or MinMax control designs. However, to achieve real-time control algorithms, these compensators must have low computational complexity. Model reduction methods are a natural choice to build reduced-order compensators, and include Kalman and extended Kalman filters. We describe an input-independent model reduction approach that is based on rational approximation of transfer functions and provide numerical results for the control of Burgers and Navier-Stokes equations.

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