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A New Approach to Model Order Reduction of the Navier-Stokes Equations[1] MACIEJ BALAJEWICZ, EARL DOWELL, Duke University, BERND NOACK, Institute PPRIME — A new approach to model order reduction of the Navier-Stokes equations is proposed. Unlike traditional approaches, this method does not rely on empirical turbulence modeling or modification of the Navier-Stokes equations. It provides spatial basis functions different from the usual proper orthogonal decomposition basis function in that, in addition to optimally representing the solution, the new basis functions also provide stable reduced-order models. The proposed approach is illustrated with two test cases: two-dimensional flow inside a square lid-driven cavity and a two-dimensional mixing layer.

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