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Dynamic mode shaping for transient growth suppression¹ MAZIAR HEMATI, HUAIJIN YAO, Univ of Minnesota - Twin Cities — Sub-critical transition to turbulence is often triggered by transient energy growth attributed to the non-normality of the linearized Navier-Stokes operator. Here, we formulate a series of feedback control strategies that aim to reduce and suppress transient energy growth using a dynamic mode shaping perspective. In particular, we present controller synthesis techniques for dynamic mode matching and dynamic mode orthogonalization, which allow for spectral specification of the closed-loop dynamics. We demonstrate the control schemes on a number of illustrative examples and discuss extensions to large-scale and nonlinear systems.

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