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Linear forcing response of subsonic jets XAVIER GARNAUD, LUTZ LESSHAFFT, PATRICK HUERRE, PETER SCHMID, LadHyX, CNRS / Ecole Polytechnique, France — The linear stability of spatially developing subsonic jets is investigated. A parametric base flow model is employed that matches experimental data for turbulent mean flows and that includes a solid nozzle. Temporal eigenmodes are computed using a newly developed "shift-relax" method. All eigenmodes are found to be stable in an isothermal setting. While this observation is in agreement with classical local stability results, a stable eigenmode spectrum seems inappropriate for the description of the convective instability dynamics of jets, which are known to be highly receptive to external perturbations. Instead, we propose to characterize jet instability in terms of the linear global flow response to sustained low-level forcing. External perturbations inside the nozzle duct are identified that give rise to the most amplified flow response at a prescribed frequency. Results will be discussed both for incompressible and compressible settings.

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