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Global modes of compressible subsonic jets XAVIER GARNAUD, LUTZ LESSHAFFT, PETER J. SCHMID, PATRICK HUERRE, LadHyX, CNRS - Ecole Polytechnique — Global instability modes are computed for spatially developing jets at high subsonic Mach number. Both isothermal and hot configurations are considered. The jet exits a cylindrical nozzle, which is included in the numerical domain. Particular attention is directed to the aero-acoustic features of the jet, and the acoustic far-field is resolved as part of the global mode. Accurate resolution of sound propagation requires large computational domains, as well as high-order discretization schemes, which is numerically challenging with existing techniques, in particular in terms of memory requirements. We present a novel method for the computation of direct and adjoint eigenmodes of the global instability problem. Temporal filtering, applied to a time-stepping approach, allows to extract user-selected modes at significantly lower computational cost than common matrix-based techniques.

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