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Global linear stability analysis of the jet in crossflow SHERVIN BAGHERI, PHILIPP SCHLATTER, DAN S. HENNINGSON, KTH Mechanics, Stockholm, Sweden, PETER J. SCHMID, LadHyX, Ecole Polytechnique, Paris, France — The global linear stability analysis of the jet in crossflow to three-dimensional perturbations is numerically investigated. At velocity ratio $R = 3$, defined as the ratio of jet velocity to free-stream velocity, the flow is globally linearly unstable. The baseflow for the stability analysis is a steady solution of Navier-Stokes, obtained by damping the unstable temporal frequencies using the selective frequency damping method (SFD). The steady state consists of a dominant counter-rotating vortex pair in the far field emerging from the near field vorticity of the shear layer. The eigenvalue problem is solved using the ARPACK library and the linearized DNS as a time stepper. The most unstable mode takes the shape of a localized wavepacket, wrapped around the counter-rotating vortex pair. Further, higher velocity ratios are considered in order the examine the transition from convective to absolute stability of the studied flow case.

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