The effect of confinement on the absolute/convective stability of viscous jets and wakes SIMON REES, MATTHEW JUNIPER, University of Cambridge — It has been shown recently that inviscid jets and wakes become more unstable when confined within a duct. This numerical study examines the effect of confinement on viscous jets and wakes. The numerical codes use polynomial spectral methods to solve for the equations of motion at a low computation cost, making investigation over a large range of parameter space feasible. Criteria for absolute or convective instability are found as a function of the Reynolds number, shear, shear layer thickness and confinement. The results at high Reynolds number match the inviscid case. As expected, decreasing the Reynolds number or increasing the shear layer thickness stabilizes the flow. It is not clear from previous studies whether confinement should have a stabilizing or destabilizing effect on viscous flows. However, this study shows conclusively that confinement enhances the absolute instability of viscous flows, as well as inviscid flows.

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