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The dynamics of streamwise vortices in high Re jets JAHNAVI KANTHARAJU, DAAA, ONERA Meudon 92190 , BENJAMIN LECLAIRE, LAURENT JACQUIN, DAAA, ONERA Meudon 92190 France — Streamwise vortices play an important role in the mixing and entrainment in the near field of jets. They are dynamically active structures that lead to additional flow features such as side jets and streaks. Their coexistence with and wrapping around the vortex rings suggest their possible influence on the rings as has been remarked in several studies. We present results supporting one such possible interaction between streamwise vortices and the axisymmetric ($m = 0$) mode in round jets (Davoust et. al JFM 2012) at Re in the range of 9.2×10^4 to 3.5×10^5. High speed particle image velocimetry was performed at one and two diameters downstream of the nozzle. We varied the strengths of the axisymmetric mode relative to streamwise vortices through acoustic excitation. It is shown that as the axisymmetric mode is strengthened, there is a shift in the organization of streamwise vortices from radial (in unforced case) to an azimuthal configuration that has been classically observed at low Re. Using conditional averaging, this organization was distinguished in the ring and braid region. For the excited jets, it agreed well with the literature. A theoretical model is being sought to represent this interaction and predict its effect on the near field entrainment.

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