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Linear Stability of a Compressible Coaxial Jet with Continuous Velocity and Temperature Profiles DOMINIQUE PERRAULT-JONCAS, SHERWIN MASLOWE, Department of Mathematics, McGill University — The stability of compressible coaxial jets is pertinent to the jet noise problem for turbofan engines. Because the bypass stream mixes with both the exhaust and the ambient air, multiple inflection points occur in the velocity and temperature profiles. In accordance with Rayleigh's theorem for axisymmetric incompressible shear flows, it turns out that there are three possible modes, only two of which are unstable. We have computed the properties of these modes when the exhaust flow is at Mach one with profiles corresponding to the experiments reported by Papamoschou (AIAA-2003-1059). The variation with the diameter ratio and other parameters will be shown. An integration contour indented in the complex plane was required to deal with wavenumbers for which modes are slightly amplified or neutral. It was found that the less amplified mode is important in that there is instability for a much greater range of axial wavenumber.

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