

Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

The absolute and convective transition in subsonic variable-density axisymmetric wakes PHILIPPE MELIGA, DENIS SIPP, LAURENT JACQUIN, ONERA, Meudon, France, JEAN-MARC CHOMAZ, LadHyX, Palaiseau, France — Aerodynamic buffet occurs in transonic afterbody flows due to unsteadiness of the separated flow in the vicinity of the rear region. As a step to understand the mechanisms triggering this phenomenon, we analyse the local stability properties of compressible variable-density axisymmetric wakes. The stability problem is solved by use of a collocation method providing a complete set of eigenvalues and associated eigenfunctions. The impulse response of the flow is then investigated by locating saddle points in the complex wavenumber plane and Briggs' criterion is used to determine the nature of local instabilities. Regions of convective and absolute instabilities are identified for two distinct helical modes of azimuthal wavenumber $m=1$, and absolute-convective transition is studied as a function of the wake momentum thickness, the ratios of centerline to ambient fluid density and velocity, and the Mach number in the ambient fluid.

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Date submitted: 29 Jul 2005

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