

Abstract Submitted
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The pressure field of co-axial subsonic jets with and without serrations¹ PETER JORDAN, CHARLES TINNEY, Universite de Poitiers — Data from measurements performed in the near pressure fields of subsonic co-axial jets (serrations, bypass-ratio, temperature ratio) are analyzed, where the pressure field is considered to constitute a reasonable footprint of the large-scale coherent structures (or low-order dynamic) of the flows. A comparative study shows how serrations produce considerable reductions in the nearfield pressure levels, however structural changes in the flows are more subtle. A transformation from (x-t) to (k-omega) is used to study the pressure fields in wavenumber-frequency space and permits a clearer separation of the measured pressure field into (1) purely hydrodynamic components, with subsonic phase velocity (redundant in the production of sound) and (2) hydrodynamic-acoustic mixed components with sonic and supersonic phase velocities (active in the production of radiating sound). A filtering operation, based on the dispersion inequality ($\omega > ka$), leads to a reconstruction of the sound-producing dynamic of the low-order flow structure and the statistics of this field are compared to those of the unfiltered flow dynamic. POD of the filtered pressure field identifies the subtleties of the structural changes induced by the serrations.

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