

Abstract Submitted
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Numerical simulation of formation of asymmetric acoustic streaming in resonators TAKERU YANO — Rayleigh type acoustic streaming induced by resonant gas oscillations in a closed tube is studied numerically, with particular emphasis on the flow patterns of large Reynolds number streaming motions before turbulent transition. The system of two-dimensional compressible Navier–Stokes equations is solved with a high-resolution TVD finite-difference scheme without the assumption of the symmetry of flow field. The streaming velocity field is evaluated from a time-averaged mass flux density vector. We shall demonstrate that (i) more than a thousand of acoustic cycles are required for the establishment of quasi-steady streaming; (ii) the symmetry in the flow pattern of acoustic streaming is lost when the streaming Reynolds number is moderately large, even before the transition to turbulence.

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