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**Heat transport by baroclinic acoustic streaming** JACQUES ABDUL-MASSIH, University of New Hampshire, GUILLAUME MICHEL, Ecole Normale Superieure, CNRS, CHRISTOPHER WHITE, GREG CHINI, University of New Hampshire — Recently, Chini *et al.* [*J. Fluid Mech.*, Vol. 744 (2014)] and Michel & Chini [*J. Fluid Mech.*, Vol. 858 (2019)] demonstrated that strong acoustic streaming flows can be generated in gases subjected to an imposed cross-channel temperature gradient. In contrast with classic Rayleigh streaming, standing acoustic waves of $O(\epsilon)$ amplitude acquire vorticity owing to baroclinic torques acting throughout the domain rather than via viscous torques acting in Stokes boundary layers. More significantly, these baroclinically-driven streaming flows have a magnitude that is $O(\epsilon)$, i.e. comparable to that of the sound waves, leading to fully two-way wave/mean-flow coupling. The present investigation extends these earlier studies by relaxing the restriction to small aspect-ratio domains, thereby enabling the (forced) heat transport across the channel to be quantified as a function of aspect ratio. This extension requires the numerical solution of a two-dimensional eigenvalue problem for the sound-wave frequency and mode structure. Nevertheless, the resulting computations are orders of magnitude faster than DNS of the compressible Navier-Stokes equations. The prospect for using baroclinic acoustic streaming as a cooling technology is evaluated.

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