

Numerical simulation of the shock wave in the closed resonator using 1D Lagrange's approach

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Abstract

© 2018 Institute of Physics Publishing. All rights reserved. The comparison of the results of calculating the shock wave in a two-dimensional acoustic resonator based on the 1D Lagrange approach with experimental, analytical and numerical results of other authors obtained on the basis of 2D simulation is presented. The shock wave, which arises at frequencies close to the first resonant one, is investigated. It's shown that the 1D Lagrange approach gives a satisfactory agreement with the results of 2D simulations of other authors as well as with results obtained using CFD-package Fluent in this work. It's shown that Lagrange's approach due to exact formulation of the boundary condition, high calculation speed and minimum memory requirements can be effectively used to solve a number of two-dimensional problems, as well as to verify the reliability of other numerical methods.

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