

Original Paper

A Reference Infrasound Source with Low Distortion Based on Laser Pistonphone Technology

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Abstract

For safety protection from infrasound and its metrology, a reference infrasound source was developed on the basis of the laser pistonphone technique. The electromagnetic vibrator was made based on the technology of air bearings and a displacement feedback system. The air bearings reduce the damping of the vibrator, and the displacement feedback system could effectively control the distortion of the pistonphone. Through the displacement of the piston measured by a laser interferometer, the sound pressure could be calculated. In the meantime, the sound pressure was measured by a LS1P microphone with the reciprocity calibration results. The test results show that the difference between the measured pressure and the calculated one is no more than 0.01 dB from 5 to 20 Hz and the total distortion of the sound pressure at 124.0 dB is less than 0.7 % from 1 to 20 Hz.

Keywords

Infrasound – Reference source – Laser pistonphone – Distortion