

EXPERIMENT 4: KUNDT TUBE

THEORY

Kundt's Tube is an acoustical apparatus, invented by German Physicist, August Kundt (1866). Knowing the speed of sound in air, the speed of sound v in a solid rod can be calculated based on the measurement of sound wavelength, λ . If the frequency of the sound wave, f is known, we can calculate the speed of sound.

$$v = \lambda f$$



Standing wave, also called stationary wave, combination of two waves moving in opposite directions, each having the same amplitude and frequency. The phenomenon is the result of interference—that is, when waves are superimposed, their energies are either added together or cancelled out. In the case of waves moving in the same direction, interference produces a travelling wave; for oppositely moving waves, interference produces an oscillating wave fixed in space.

PROCEDURE AND CALCULATIONS

1. Adjust the signal generator as 1kHz.
2. Calculate the frequency of wave using oilloscope.
3. Move the piston slowly, using control panel.
4. Read off the distance value for 1st minima point.
5. Again move the piston and read off the 2nd minima point distance.
6. The distance between 1st and 2nd minima points give the half of the wavelength ($\lambda/2$).
7. Calculate wavelength and velocity of the sound values.

f (Hz)	d_1 (m)	d_2 (m)	Δd (m)	λ (m)	v (m/s)