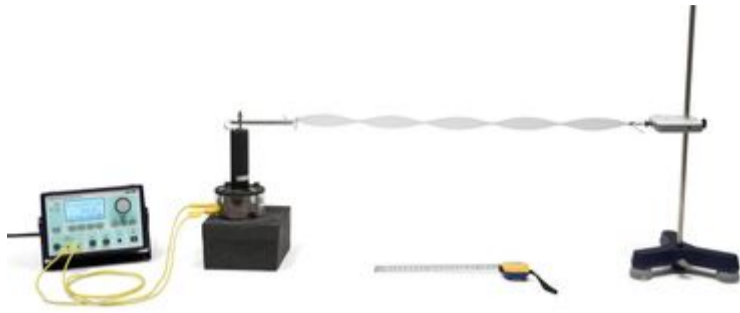


Phase velocity of standing waves with Cobra SMARTsense

Article no: P2133669



Principle

A linearly polarized standing transverse wave is generated on a rubber band with a square cross-section by means of a vibration generator. The wavelength is determined as a function of the excitation frequency. Then the phase velocity of the cable wave is changed by changing the tensile stress. The relationship between the phase velocity of the rope and the tension on the rope is investigated. With the help of a stroboscope the standing wave can be displayed even more impressively.

Tasks

1. At constant tensile stress the frequency depends on the wavelength λ of the wave propagating on the rope. The frequency is calculated as a function of $1 / \lambda$. From this diagram the phase velocity c can be determined.
2. The phase velocity c of the rope wave, which depends on the tensile stress of the rope, is to be measured. The phase velocity is displayed as a function of the tensile stress

Learning objectives

- Wavelength
- Phase Speed
- Group speed
- wave equation
- Harmonic

Benefits

- Very illustrative way to watch the propagation of waves including damping, coupling, standing waves and many more
- Slow propagation speed allows an excellent observation in particular with a stroboscope

Scope of delivery

PHYWE Digital Function Generator, USB	13654-99	1
External vibration generator for PHYWE Ripple Tank	11260-10	1
Connecting cord, 32 A, 2000 mm, yellow	07363-02	2
Cobra SMARTsense Force & Acceleration - Sensor for measuring force and acceleration ± 50 N / ± 16 g (Bluetooth + USB)	12943-00	1
Tripod base PHYWE	02002-55	1
Support rod, stainless steel, different lengths	02033-00	1
Square section rubber strip, l 10m	03989-00	1
Measuring tape, l = 2 m	09936-00	1
measureAPP - the free measurement software for all devices and operating systems	14581-61	1

Recommended accessories

Digital stroboscope	21810-93
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