

Acoustic Doppler effect 1.5.04-01

What you can learn about ...

- Propagation of sound waves
- Superimposition of sound waves
- Doppler shift of frequency
- Beat frequency

Principle:

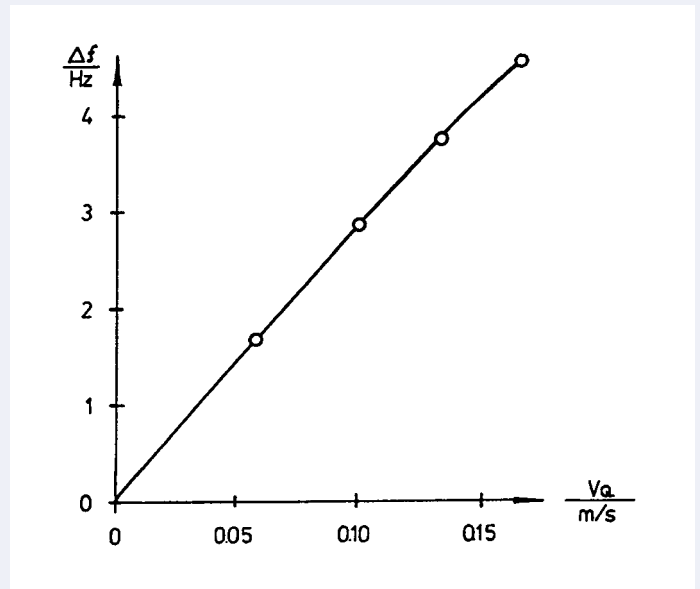
If a source of sound is in motion relative to its medium of propagation, the frequency of the waves that it emits is displaced due to the Doppler effect. With the superimposition of a moving and a stationary source of sound which are emitting waves of the same frequency, beats occur whose frequency is equal to the Doppler shift of the frequency of the moving source of sound. The Doppler shift of the frequency is measured and compared with the theoretical value for different velocities of the sound emitting source.



What you need:

Measuring microphone	03542.00	1
Sound head	03524.00	2
Power frequency generator 1 MHz	13650.93	1
Yt recorder, 1 channel	11414.95	1
Car, motor driven	11061.00	1
Attachment for car	11061.02	1
Round cell, 1.5 V	07922.01	2
Meter scale, demo, $l = 1000$ mm	03001.00	1
Stopwatch, digital, 1/100 sec.	03071.01	1
Barrel base -PASS-	02006.55	2
Stand tube	02060.00	1
Connecting cord, $l = 750$ mm, yellow	07362.02	2
Connecting cord, $l = 1500$ mm, blue	07364.04	2

Complete Equipment Set, Manual on CD-ROM included
Acoustic Doppler effect P2150401



Beat frequency as a function of velocity v_0 .

Tasks:

1. The Doppler shift of the frequency of the moving source of sound is to be determined by measuring the beat frequency.
2. The measured values are to be compared with the calculated ones for velocities in the range between 0.06 and 0.16 m/sec.