

The Physics Experiments of Robert Wichard Pohl (1884–1976)

For decades, Robert Wichard Pohl taught his famous lectures of introductory physics in the old lecture hall of the Physics Institute at Goettingen University. These lectures became the foundation for three volumes entitled „Introduction into Physics“. Now, using Professor Pohl's original instruments in the same lecture hall in which he taught, this set of videos captures his extraordinary ingenuity and once more brings to life Pohl's great experimental skills.



Circular oscillations

Video title: Circular oscillations

Signature: C 14863

Series title: The Physics Experiments of Robert Wichard Pohl (1884-1976)

Abstract: Through superposition of the linear oscillations of two leaf springs of almost equal frequencies, linear, elliptic and circular oscillations can be generated and shown by optical projection. The springs carry disks with slits and can vibrate perpendicularly to each other. Where the two slits overlap, a hole is found through which light can shine. As this hole moves, a trace is formed on the projection screen.

Source: Pohls Einführung in die Physik - Mechanik, Akustik und Wärmelehre. Lüders, Klaus; Pohl, Robert Otto (Hrsg.) 19. Aufl., 2005, Springer Berlin Heidelberg New York; p. 39

Key words: Mechanics, bending vibrations, circular, elliptic and linear oscillations

Goal of the experiment: Through superposition of the linear oscillations of two leaf springs of almost equal frequencies, linear, elliptic and circular oscillations can be generated and shown by optical projection.

Experimental setup: Two leaf springs carry disks with slits. They can vibrate perpendicularly to each other. Where the two slits overlap, a hole is formed through which light can shine. As this hole moves, a trace is formed on the projection screen.

Experiment: After exciting the individual oscillators separately and watching their amplitudes decay, both are excited simultaneously. Elliptic, circular, and even linear traces are seen, varying with time. The explanation is that the two leaf spring oscillators have slightly different frequencies. This leads to phase differences between the two oscillations which change with time.

(The discontinuous traces seen are a stroboscopic effect caused by the way in which the video is shot: Each exposure lasts 0.02 sec, and is separated from its neighbors by the same time.)

Info: <http://mkat.iwf.de/index.asp?Signatur=C+14863&Language=en>

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