

Zeeman Effect

our Nobel Prize experiment



Discover the splitting of the spectral lines of atoms within a magnetic field with the Zeeman effect

The Zeeman effect is a classical experiment out of the long line of Nobel Prize Laureate experiments offered by PHYWE. This single system allows study of both the normal as well as the anomalous Zeeman effect – only a simple filter exchange is required. Also the transversal and the longitudinal Zeeman effect are observable. The combination of these experiments in only one experimental set-up offers many instructional advantages.

What you can learn about

normal and anomalous Zeeman effect

transversal and longitudinal Zeeman effect

Bohr's atomic model

Quantisation of energy levels

Electron spin

Bohr's magneton

Interference of electromagnetic waves

Fabry-Perot interferometer

The experiment in a nutshell

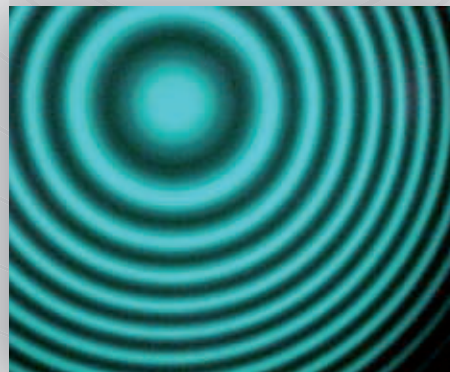
The Zeeman effect is the splitting of the spectral lines of atoms within a magnetic field. The simplest is the splitting up of one spectral line into three components called "normal Zeeman effect". Usually the phenomenon is more complex and the central line splits into many more components. This is the "anomalous Zeeman effect". Both effects can be studied using a cadmium lamp as a specimen. The cadmium lamp is submitted to different magnetic flux densities and the splitting of the red cadmium line (normal Zeeman effect) and that of a green cadmium line (anomalous Zeeman effect) is investigated using a Fabry-Perot interferometer. The evaluation of the results leads to a fairly precise value for Bohr's magneton.

If observation is transversal to the field (transversal effect), two lines polarised perpendicularly to the field and one line polarised parallel to the field are observed, whereas if observation is in field direction (longitudinal effect), 2 circular polarised lines are observed.

Normal Zeeman effect



Anomalous Zeeman effect



Products

Zeeman Effect - normal and anomalous version

Complete equipment Set

P2511005

The set consists of:

cadmium lamp for Zeeman Effect, electromagnet without pole shoes, pole pieces, drilled, conical, 1 pair, rotating table for heavy loads, power supply for spectral lamps, base for optical profile bench, adjustable, slide mount for optical profile bench, h = 30 mm, slide mount for optical profile bench, h = 80 mm, lens holder, CCD-camera for PC-use, USB, PC with USB interface, Windows 98SE/Windows Me/Windows 2000/Windows XP

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