

## 5.1.10-05 Zeeman effect/normal and anomalous version



**NEW**  
**BEST  
SELLER**

## What you can learn about ...

- Bohr's atomic model
- Quantisation of energy levels
- Electron spin
- Bohr's magneton
- Interference of electromagnetic waves
- Fabry-Perot interferometer

## Principle:

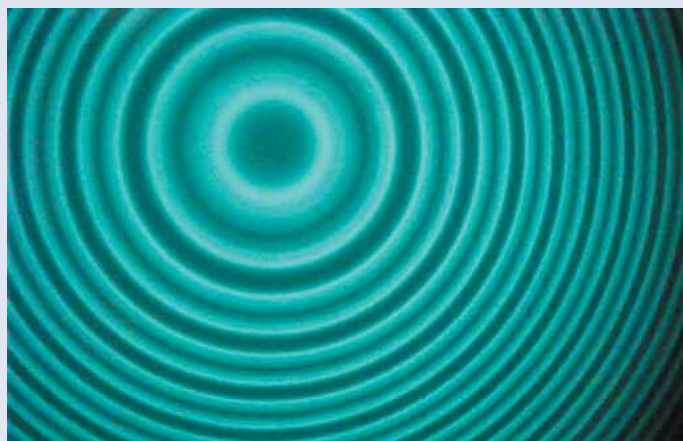
The "Zeeman effect" is the splitting of the spectral lines of atoms within a magnetic field. The simplest is the splitting up of one spectral line into three components called "normal Zeeman effect". Usually the phenomenon is more complex and the central line splits into many more components. This is 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

## What you need:

Fabry-Perot interferometer	09050.02	1
Cadmium lamp for Zeeman effect	09050.01	1
Electromagnet without pole shoes	06480.01	1
Pole pieces, drilled, conical, 1 pair	06480.03	1
Rotating table for heavy loads	02077.00	1
Power supply for spectral lamps	13662.97	1
Variable transformer 25 V~/20 V-, 12 A	13531.93	1
Electrolyte capacitor, 22000 µF	06211.00	1
Digital multimeter 2010	07128.00	1
Optical profile bench, $l = 1000$ mm	08282.00	1
Base for optical profile bench, adjustable	08284.00	2
Slide mount for optical profil bench, $h = 30$ mm	08286.01	5
Slide mount for optical profil bench, $h = 80$ mm	08286.02	2
Lens holder	08012.00	4
Lens, mounted, $f = +50$ mm	08020.01	2
Lens, mounted, $f = +300$ mm	08023.01	1
Iris diaphragm	08045.00	1
Polarisation filter on stem	08610.00	1
Polarisation specimen, mica	08664.00	1
Connecting cable, 4 mm plug, 32 A, red, $l = 25$ cm	07360.01	1
Connecting cable, 4 mm plug, 32 A, blue, $l = 25$ cm	07360.04	1
Connecting cable, 4 mm plug, 32 A, red, $l = 50$ cm	07361.01	1
Connecting cable, 4 mm plug, 32 A, blue, $l = 50$ cm	07361.04	1
Connecting cable, 4 mm plug, 32 A, red, $l = 75$ cm	07362.01	1
Connecting cable, 4 mm plug, 32 A, red, $l = 100$ cm	07363.01	1
Connecting cable, 4 mm plug, 32 A, blue, $l = 100$ cm	07363.04	1
CCD-camera for PC-use, USB*	88037.00	1
PC with USB interface, Windows 98SE/Windows Me/Windows 2000/Windows XP		

\*Alternative to CCD-Camera incl. measurement software, two slide mounts,  $h = 80$  mm for classical version of the Zeeman Effect:

Slide mount for optical profile-bench,	08286.00	1
Sliding device, horizontal	08713.00	1
Swinging arm	08256.00	1



Interference rings with the anomalous Zeeman effect.

(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.

## Tasks:

1. Using the Fabry-Perot interferometer and a self made telescope the splitting up of the central lines into different lines is measured in wave numbers as a function of the magnetic flux density.
2. From the results of point 1. a value for Bohr's magneton is evaluated.
3. The light emitted within the direction of the magnetic field is qualitatively investigated.

Plate holder with tension spring	08288.00	1
Screen, with aperture and scale	08340.00	1
Slide mount for opt. profile-bench, $h = 80$ mm	08286.02	1

**Complete Equipment Set, Manual on CD-ROM included**  
**Zeeman effect/normal and anomalous version P2511005**