

5.1.10-05 Zeeman effect with CCD-Camera incl. measurement software



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:

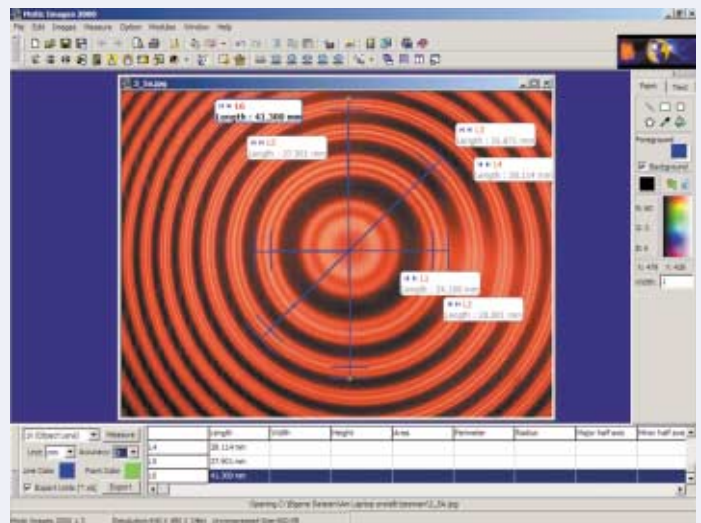
The "Zeeman effect" is the splitting up of the spectral lines of atoms within a magnetic field. The simplest is the splitting up of one spectral line into three components called the "normal Zeeman effect". The normal Zeeman effect is studied using a cadmium spectral lamp as a specimen. The cadmium lamp is submitted to different magnetic flux densities and the splitting up of the red cadmium line (643.8 nm) is investigated using a Fabry-Perot interferometer. The evaluation of the results leads to a fairly precise value for Bohr's magneton.

What you need:

Fabry-Perot interferometer	09050.02	1
Cadmium lamp for Zeeman Effect	09050.01	1
Electromagnet w/o pole shoes	06480.01	1
Pole pieces, drilled, conical	06480.03	1
Rotating table for heavy loads	02077.00	1
Power supply for spectral lamps	13662.97	1
Variable transformer, 25 V AC/20 V DC, 12 A	13531.93	1
Capacitor, electrolytic, 22000 μ F	06211.00	1
Digital multimeter	07134.00	1
Optical profile-bench, $l = 1000$ mm	08282.00	1
Base for opt.profile-bench, adjust.	08284.00	2
Slide mount for optical profile-bench, $h = 30$ mm	08286.01	5
Slide mount for optical profile-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
Polarising filter, on stem	08610.00	1
Polarization specimen, mica	08664.00	1
Connecting cord, $l = 25$ cm, 32 A, red	07360.01	1
Connecting cord, $l = 25$ cm, 32 A, blue	07360.04	1
Connecting cord, $l = 50$ cm, 32 A, red	07361.01	1
Connecting cord, $l = 50$ cm, 32 A, blue	07361.04	1
Connecting cord, $l = 75$ cm, 32 A, red	07362.01	1
Connecting cord, $l = 100$ cm, 32 A, red	07363.01	1
Connecting cord, $l = 100$ cm, 32 A, blue	07363.04	1
CCD-Camera for PC incl. measurement software*	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 the classical version of the Zeeman Effect:

Slide mount for opt.profile-bench	08286.00	1
Sliding device, horizontal	08713.00	1



Screenshot of software used to measure the diameters of the interference rings as captured by the CCD-Camera.

Tasks:

1. Using the Fabry-Perot interferometer and a selfmade telescope the splitting up of the central line into two σ -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.

Swinging arm	08256.00	1
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 with CCD-Camera
incl. measurement software **P2511005**