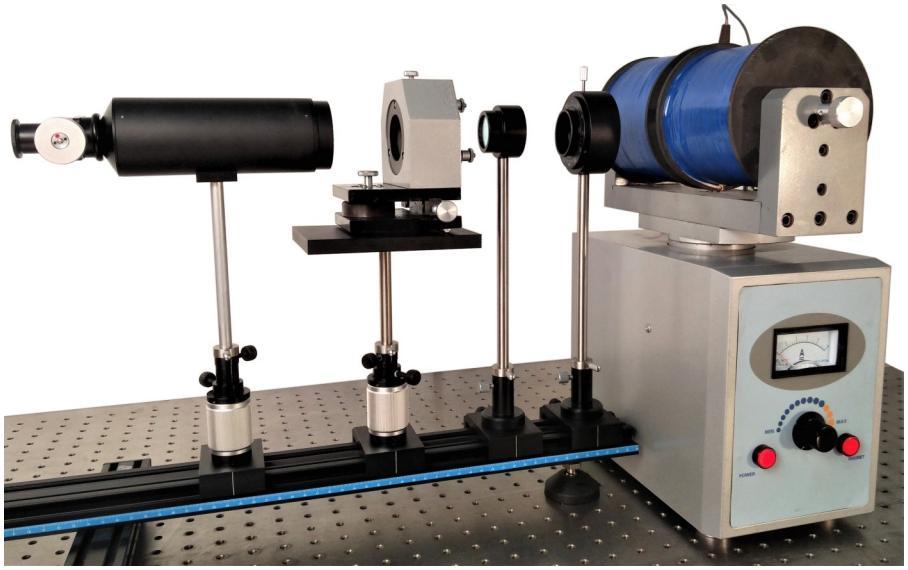
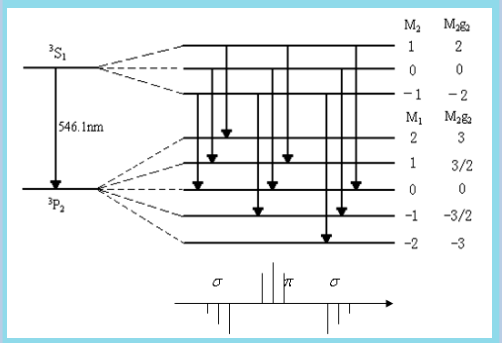
Construct, Conduct & Comprehend Physics Experiments

LEAI-26 Zeeman Effect Apparatus with Electromagnet



- *Electromagnet*
- *Transverse & longitudinal Zeeman effects*
- *Optional CCD camera with analysis software*



Zeeman effect and intensity distribution of Mercury green line

Zeeman effect experiment is an important experiment in modern physics to confirm the existence of atomic magnetic moment and spatial quantization. It can be used to determine atomic energy levels and g factor, and verify the theory of electron spin. This LEAI-26 Zeeman effect experimental apparatus uses an electromagnet to split a specific spectral line of a Mercury lamp to generate π lines and σ lines. A direct reading microscope is used to measure the interference pattern from a F-P etalon. Both transverse and longitudinal normal Zeeman effects can be observed. An optional CCD and analysis software can be used to acquire and analyze the interference pattern.

Experimental contents are as follows:

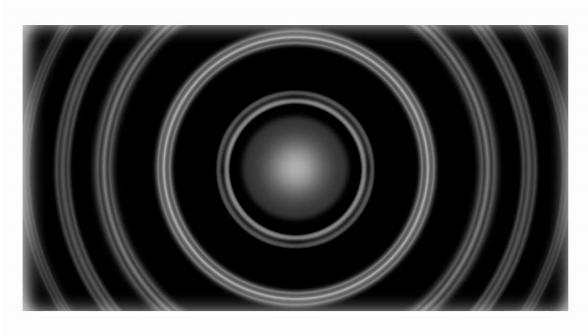
1. Observe Zeeman effect and understand atomic magnetic moment and spatial quantization in atomic physics.
2. Observe the splitting and the polarization of a Mercury atomic spectral line at 546.1 nm.
3. Determine the quantum number and Lande's factor.
4. Understand the principle and learn how to use a FP etalon.

Specifications

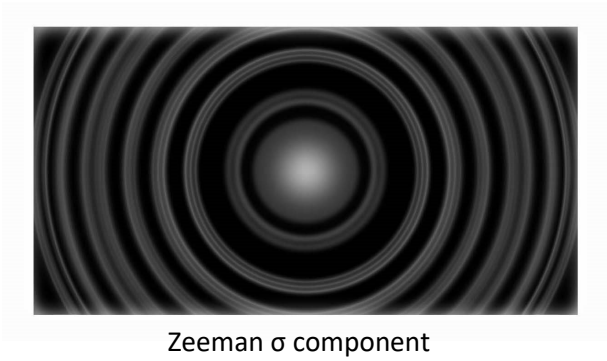
Electromagnet	> 1 T; > 90º rotatory; open hole in one pole (dia: 6 mm)
Etalon	quartz
	dia: 40 mm
	length: 2 mm (air)
	finesse: ≥ 50
	flatness:< λ/30
	CWL: 589.3 nm
	resolution (λ/dλ): > 2 x 10^5
	HR bandwidth: 100 nm
Pencil Hg lamp	emitter diameter: 6.5 mm; power: 3 W
Interference filter	CWL: 546.1 nm; passband: < 10 nm; transmittance: > 50%
Polarizer	360º scale

Part List

Pencil Mercury Lamp	1
Electromagnet	1
Lens with Support	1
F-P Etalon	1
Polarizer	1
Interference Filter at 546.1 nm	1
Microscope Eyepiece	1
Optical Rail (0.6 m)	1
Carrier Slide	4
Tesla Meter	1
λ/4 Wave Plate	1
Optional CCD, USB & Software	1 set
Instructional Manual	1



Zeeman π component



Zeeman σ component

Note: above product information is subject to change without notice.

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