

LEAI-26 Zeeman Effect Apparatus with Electromagnet



The LEAI-26 Zeeman Effect Apparatus with Electromagnet is a powerful experimental system designed to explore and demonstrate the Zeeman effect, a crucial phenomenon in modern physics. The Zeeman effect is instrumental in confirming the existence of atomic magnetic moments and the spatial quantization of atomic energy levels. This apparatus is ideal for studying the interaction between light and magnetic fields, which is fundamental to understanding the electron spin theory and the g-factor of atoms.

In this system, an electromagnet is used to induce a magnetic field that causes the splitting of the Mercury spectral line at 546.1 nm into π and σ lines, providing clear observation of the Zeeman effect. The system includes a direct-reading microscope for measuring the interference pattern created by the Fabry-Perot (F-P) etalon. An optional CCD camera with analytical software can be employed to capture and analyze the interference pattern to calculate the Bohr magneton. Additionally, a wideband F-P etalon allows the observation of Zeeman effects across different Mercury spectral lines (577 nm, 436 nm, 404 nm), which can be selectively observed using optional filters.

The instruction manual contains comprehensive materials including experimental configurations, principles and step-by-step instructions.

Using this instrument, the following experiments can be conducted:

Observe transverse & longitudinal Zeeman effects of Mercury at 546.1 nm
 Understand atomic magnetic moment & spatial quantization in atomic physics

3. Observe the splitting and the polarization of a Mercury spectral line at 546.1 nm

4. Determine the quantum number, the Bohr magneton, and Lande's factor 5. Learn how to use a Fabry-Perot etalon.

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



Zeeman effect and intensity distribution of Mercury green line

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Specifications

Item	Specifications
Electromagnet	magnetic field strength: > 1.0 T
	> 90° rotatory with an open hole in one pole (dia: 6 mm)
	pole diameter: 25 mm
	pole spacing: 10 mm
Etalon	quartz
	diameter: 40 mm
	spacing: 2 mm (air)
	finesse: ≥ 50
	flatness:< λ/30
	CWL: 589.3 nm
	resolution ($\lambda/d\lambda$): > 2 x 10 ⁵
	reflectivity: > 90%
	HR bandwidth: >100 nm
Pencil Hg lamp	emitter diameter: 6.5 mm; power: 3 W
Interference filter	CWL: 546.1 nm; transmittance: > 80%
Polarizer	360° rotational
λ/4 Plate	at 546 nm including mounting magnets
Eyepiece	15 X; measuring range: 8 mm; resolution: 0.01 mm

Part List

Description	Qty
Pencil Mercury Lamp	1
Electromagnet	1
Condensing Lens	1
F-P Etalon	1
Polarizer	1
Interference Filter (546 nm)	1
Reading Microscope	1
Imaging Lens	1
Power Supply Unit (Hg Lamp and Electromagnet)	1
Optical Rail	1
Slide	4
λ/4 Plate	1
Tesla Meter with AC Adapter	1
CCD, USB interface & software	option 1
Interference filters with mount at 577 & 435 nm	option 2

Lambda Scientific Systems, Inc. 16300 SW 137th Ave, Unit 132 Miami, FL 33177, USA Phone: 305.252.3838 Fax: 305.517.3739 E-mail: sales@lambdasys.com Web: www.lambdasys.com



Zeeman π component



Zeeman σ component

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