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Product Name :

Complete Zeeman Effect Apparatus

Product Code :

SLE/EM/10



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Description :

Complete Zeeman Effect Apparatus (Product Code: SLE/EM/10) is an integrated bench system for observing the Zeeman effect — the splitting of an atomic spectral line when the emitting atoms are placed in a strong magnetic field. A slim mercury discharge lamp sits between the poles of a built-in, current-controlled electromagnet that reaches up to 1.3 T at the lamp position; the 546.1 nm emission line is isolated by an interference filter, collimated by a lens and resolved with a Fabry-Pérot etalon so that the splitting can be seen and measured. Manufactured by **Jain Scientific Equipments Pvt Ltd (ScienceLab)**, Ambala, a physics instruments supplier in India, it is intended for university and college modern-physics and spectroscopy laboratories.

Specifications

Parameter	Detail
Lamp	Mercury discharge lamp, slim design, AC, 1,500 Vp-p, 5 W
Observed emission line	546.1 nm
Maximum magnetic field at lamp position	1.3 T
Electromagnet	Built-in, current-controlled; magnet rotatable 90° for transverse or longitudinal viewing
Electromagnet power supply	90-V DC, 0.5 to 1.4 A, with analog ammeter
Fabry-Pérot etalon	Aperture 40 mm; quartz plate separation 2.0 mm; central wavelength 589.3 nm; resolution ? 2 × 10^5; high-reflection bandwidth 100 nm
Interference filter	Central wavelength 546.1 nm; transmission bandwidth ? 10 nm; peak transmission ? 50%
Collimating lens	Aperture 37 mm; focal length 110 mm
Operating limits	0 to 40 °C (32 to 104 °F); humidity 35% to 80%
Power input	110-V AC, 60 Hz, 190 W
Dimensions	2 x 0.75 m
Weight	36.4 kg (80 lb)

Typical Use

With the field off, the etalon shows a set of sharp interference rings from the single mercury line. As the magnet current is raised, each ring splits into components whose separation grows with the field. Viewing across the field (transverse) and along it (longitudinal) — made possible by rotating the magnet through 90° — lets students compare the patterns seen in the two directions and relate them to angular-momentum selection rules. Measuring ring diameters at several magnet currents gives the energy splitting as a function of field, from which the Bohr magneton or the specific charge of the electron can be estimated.

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