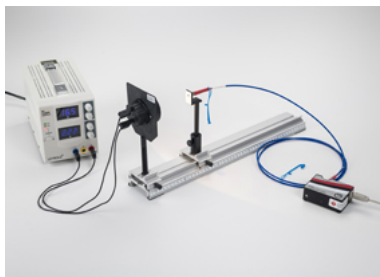


The Wien's displacement law - spectral recording of the black body radiation

Numero P5.5.2.4



Descrizione

In the experiment P5.5.2.4 an incandescent lamp, an electric conductor is heated by an electric current causing it to glow. The emitted spectrum is continuous and can be described with Planck's radiation formula. The radiation maximum of the radiation shifts with increasing temperature T according to Wien's displacement law $\lambda_{\max} = 2.9 \cdot 10^{-3} \text{ m} \cdot \text{K} / T$

toward smaller wavelengths; at the same time the maximum value of the radiation increases. At the temperatures attained by normal incandescent lamps, about 2300 to 2900 K, the radiation maximum lies in the infrared spectral range. Halogen lamps reach a somewhat higher operating temperature of about 3000 K. This experiment will record the spectra of a halogen lamp at different power levels. The specification for color temperature at 12 V nominal voltage allows the wavelength dependency of spectrometer sensitivity to be determined and thus permits a corrected display for the course of spectra intensity. Subsequently voltage will be applied to a halogen lamp then reduced in steps. The lamp's color temperature at each voltage step will be determined by adapting a suitable fit function.

Dispositivi

Richiesto	Dispositivo
0/1	Spectrometer, physics
0/1	Halogen lamp, 12 V/20 W
0/1	DC Power Supply 0...16 V/0...5 A
0/1	Optical bench, S1 profile, 0.5 m
0/1	Clamp rider with clamp 45/65
0/1	Clamp rider with fixing column
0/2	Connecting lead 19 A, 50 cm, black