

Determination of the diffraction intensity at slit and double slit systems 2.3.05-00

What you can learn about ...

- Huygens principle
- Interference
- Fraunhofer and Fresnel diffraction
- Coherence
- Laser

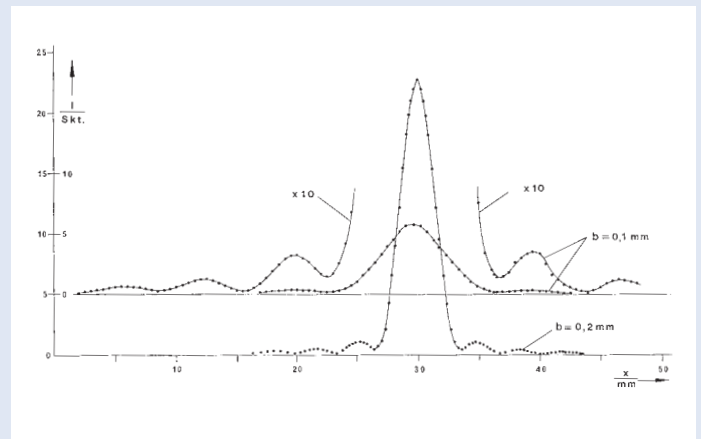
Principle:

Slit and double slit systems are illuminated with laser light. The corresponding diffraction patterns are measured by means of a photodiode which can be shifted, as a function of location and intensity.



What you need:

Laser, He-Ne 1.0 mW, 230 VAC	08181.93	1
Universal measuring amplifier	13626.93	1
Optical profile bench, $l = 1500$ mm	08281.00	1
Base for optical profile bench, adjustable	08284.00	2
Slide mount for optical profil bench, $h = 30$ mm	08286.01	5
Sliding device, horizontal	08713.00	1
Lens holder	08012.00	2
Object holder 50 mm x 50 mm	08041.00	1
Lens, mounted, $f = +20$ mm	08018.01	1
Lens, mounted, $f = +100$ mm	08021.01	1
Photoelement for optical base plate	08734.00	1
Diaphragm with 3 single slits	08522.00	1
Diaphragm with 4 double slits	08523.00	1
Digital multimeter 2010	07128.00	1
Connecting cable, 4 mm plug, 32 A, red, $l = 75$ cm	07362.01	1
Connecting cable, 4 mm plug, 32 A, blue, $l = 75$ cm	07362.04	1

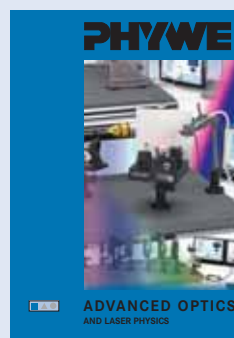


Diffraction intensity I as a function of location x for the single slit $b_1 = 0.1$ mm and $b_2 = 0.2$ mm. The x axis of the graph for $b_1 = 0.1$ mm is shifted upwards. The intensity of the areas next to the central peak is represented enlarged by a factor of 10. (Distance between slit and photodiode $L = 107$ cm; $\lambda = 632.8$ nm).

Complete Equipment Set, Manual on CD-ROM included
Determination of diffraction intensity at slit and double slit systems P2230500

Tasks:

1. Determination of the intensity distribution of the diffraction patterns due to two slits of different widths. The corresponding width of the slit is determined by means of the relative positions of intensity values of the extremes. Furthermore, intensity relations of the peaks are evaluated.
2. Determination of location and intensity of the extreme values of the diffraction patterns due to two double slits with the same widths, but different distances between the slits. Widths of slits and distances between the slits must be determined as well as the intensity relations of the peaks.



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 (see page 121)