数据处理过程

环数i	30	25	20	15	10	5
d_n	20.431	20.790	21.290	21.635	22.120	22.772
d'_n	29.228	28.874	28.481	28.045	27.532	26.901
$D_{nk}=d'_n-d_n$	8.797	8.084	7.691	6.410	5.412	4.129

环数i	30	25	20	15	10	5
d_n	20.385	20.745	21.140	21.571	22.090	22.749
d'_n	29.225	28.872	28.480	28.042	27.529	26.870
$D_{nk}=d'_n-d_n$	8.840	8.127	7.340	6.471	5.439	4.121

环数	30	25	20	15	10	5
D	8.827	8.107	7.456	6.448	5.428	4.125
仪器误差$\Delta_{仪}$	0.005	0.005	0.005	0.005	0.005	0.005
U_D	0.082	0.076	0.655	0.111	0.049	0.015

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$$\lambda_{钠黄光平均波长} = 589.3nm$$

$$U_l = 0.3nm$$

$$n = 3, \frac{t_p}{\sqrt{n}} \approx 2.5$$

$$S_x = \sqrt{\frac{\sum(x_i - \bar{x})}{n-1}}$$

$$|\Delta_{仪}| = (5 + \frac{L}{15})(\mu m)$$

$$U_s = \sqrt{|\Delta_{仪}|^2 + (\frac{t_p}{\sqrt{n}} S_x)^2}$$

误差传递公式：

$$U_p = \sqrt{(\frac{\delta_\phi}{\delta_y} U_x)^2 + (\frac{\delta_\phi}{\delta_y} U_y)^2}$$

$$\Rightarrow U_{\frac{}{D_n^2 - D_m^2}} = 0.76mm^2$$

$$\Rightarrow R \pm U_R = 1.048 \pm 0.020$$

$$|\Delta_{仪}| = (5 + \frac{L}{15})(\mu m)$$

$$L = 34.756mm$$
$$U_l = 0.007mm$$

次数n	1	2	3
l_0 (mm)	35.061	32.970	29.100
l_0 (mm)	32.721	30.567	26.645
l (mm)	2.340	2.403	2.455

$$n = 3, \frac{t_p}{\sqrt{n}} \approx 2.5$$

$$S_x = \sqrt{\frac{\sum(x_i - \bar{x})}{n-1}}$$

$$\bar{d} = N\frac{\lambda}{2} = 10\lambda\frac{l}{\bar{l}}$$

$$\Rightarrow \bar{d} = 0.08537mm$$

$$U_l = 10\sqrt{(\frac{l}{\bar{l}}U_\lambda)^2 + (\frac{\lambda}{\bar{l}}U_l)^2 + (\lambda L\frac{l}{\bar{l}^2}U_{\bar{l}})^2} \approx 0.0029mm$$

$$\Rightarrow d \pm U_d = 0.08537 \pm 0.0029mm$$