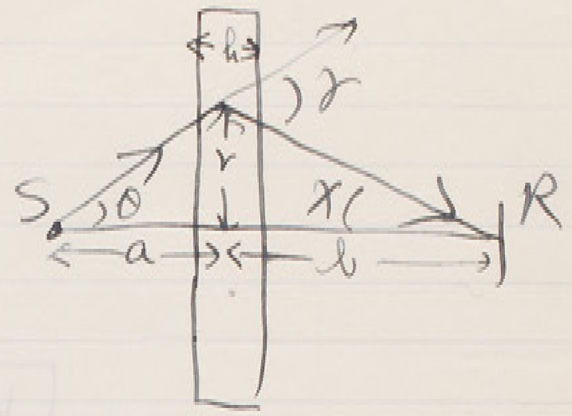
大阪帝國大學理學部 試驗答案用紙 ( )



$$N_0\cdot\frac{2\pi r\,dr\cos\theta}{a^2+r^2}\cdot\frac{h\cdot 2\cos\gamma}{\lambda_0\cos\theta}\cdot\frac{s\cos\chi}{b^2+r^2}$$

$$= N_0\cdot\frac{4\pi s h}{\lambda_0}\cdot\frac{b(ab-r^2)\,r\,dr}{(a^2+r^2)^{\frac{3}{2}}(b^2+r^2)^2}$$

$$\cos\chi = \frac{b}{(b^2+r^2)^{\frac{1}{2}}}$$

$$r = \frac{\left\{(a+b)^2+4ab\frac{1-\frac{E}{E_0}}{\frac{E}{E_0}}\right\}^{\frac{1}{2}}-(a+b)}{2\frac{\sqrt{1-\frac{E}{E_0}}}{\sqrt{\frac{E}{E_0}}}}$$

$$k = \tan\gamma = \frac{\tan\theta+\tan\chi}{1-\tan\theta\tan\chi} = \frac{r(a+b)}{ab-r^2}$$

$$= \frac{\left\{4ab+(a-b)^2\frac{E}{E_0}\right\}^{\frac{1}{2}}-(a+b)\sqrt{\frac{E}{E_0}}}{2\sqrt{1-\frac{E}{E_0}}}$$

$$ab-r^2 = \frac{r(a+b)}{k} = \frac{\sqrt{\frac{E}{E_0}}\,r(a+b)}{\sqrt{1-\frac{E}{E_0}}}$$

$$\cos\gamma = \frac{1}{\sqrt{1+\tan^2\gamma}} = \frac{ab-r^2}{\sqrt{(ab-r)^2+r^2(a+b)^2}} = \frac{ab-r^2}{(a^2+r^2)^{\frac{1}{2}}(b^2+r^2)^{\frac{1}{2}}}$$

$$dr = \frac{1}{2k}\left\{\frac{4k\,ab}{\sqrt{}}\right.$$

$$\left.-\frac{\sqrt{\,''\,}-(a+b)}{k}\right\}dk$$

$k =$ ~~$\tan\gamma^2\ 1-$~~

$$kr^2+(a+b)r-kab=0$$

$$r = \frac{\sqrt{(a+b)^2+4k^2ab}-(a+b)}{2k}$$

$$= \frac{4k^2ab-(a+b)^2+(a+b)\sqrt{\,''\,}}{2k^2\sqrt{\,''\,}}dk$$

$$k = \frac{\sqrt{1-\frac{E}{E_0}}}{\sqrt{\frac{E}{E_0}}}$$

$$= \frac{(a+b)}{k\sqrt{\,''\,}}\,r\,dk =$$

$$dk = \frac{-\frac{d\frac{E}{E_0}}{2\sqrt{\,''\,}}-\frac{\sqrt{\,''\,}\,d\frac{E}{E_0}}{2\sqrt{\frac{E}{E_0}}}}{\sqrt{\frac{E}{E_0}}}$$

$$= \frac{(a+b)r}{k\sqrt{(a+b)^2+4k^2ab}}\cdot\frac{d\frac{E}{E_0}}{2\sqrt{\frac{E}{E_0}}^{3}\sqrt{1-\frac{E}{E_0}}} = \frac{d\frac{E}{E_0}}{2\sqrt{\frac{E}{E_0}}^{3}\left(1-\frac{E}{E_0}\right.}$$

$$= \frac{(a+b)r}{\sqrt{}}\cdot\frac{d\frac{E}{E_0}}{2\left(1-\frac{E}{E_0}\right)}$$