

34. After passing through the first polarizer the initial intensity I_0 reduces by a factor of $1/2$. After passing through the second one it is further reduced by a factor of $\cos^2(\pi - \theta_1 - \theta_2) = \cos^2(\theta_1 + \theta_2)$. Finally, after passing through the third one it is again reduced by a factor of $\cos^2(\pi - \theta_2 - \theta_3) = \cos^2(\theta_2 + \theta_3)$. Therefore,

$$\begin{aligned}\frac{I_f}{I_0} &= \frac{1}{2} \cos^2(\theta_1 + \theta_2) \cos^2(\theta_2 + \theta_3) \\ &= \frac{1}{2} \cos^2(50^\circ + 50^\circ) \cos^2(50^\circ + 50^\circ) = 4.5 \times 10^{-4} .\end{aligned}$$