

87. ヤングの実験

(8)

$$\begin{aligned} \text{光路差} &= S_2P + a - (S_1P + na) \\ &= S_2P - S_1P - a(n-1) \\ &= \frac{dx}{L} - a(n-1) \end{aligned}$$

より,

$$\text{明線条件は, } \frac{dx}{L} - a(n-1) = m\lambda$$

$$m=0 \text{ より, } \frac{dx}{L} - a(n-1) = 0$$

$$\therefore x = \frac{(n-1)aL}{d} \quad \dots \text{(答)}$$

(10)

$$\begin{aligned} \text{光路差} &= S_0S_2 + S_2P - (S_0S_1 + S_1P) \\ &= S_0S_2 - S_0S_1 + (S_2P - S_1P) \\ &= S_0S_2 - S_0S_1 + \frac{dx}{L} \end{aligned}$$

より,

$$\text{明線条件は, } S_0S_2 - S_0S_1 + \frac{dx}{L} = m\lambda$$

$$x=0 \text{ のとき, } m=1 \text{ だから, } S_0S_2 - S_0S_1 = \lambda$$

$$\text{このとき, 上に } \alpha \text{ 移動させたとするとき, } \frac{d\alpha}{l} = \lambda$$

$$\text{よって, } \alpha = \frac{l\lambda}{d} \quad \dots \text{(答)}$$