

$$\left\{ \begin{array}{l} R_E = \frac{\langle +|\bar{x}_2|4^{\circ}i_u \rangle}{I(x_0; 0)} + \frac{I(x_0; 0) - I(x_0; \pi)}{4 \cdot I(x_0; 0)} \\ I_m = \frac{1}{4} [I(x_0; -\pi/2) - I(x_0; \pi/2)] \end{array} \right. \quad [2024/6/24] \quad \textcircled{1}$$

$$I(x_0; x) = |\langle +|4^{\circ}i_u \rangle|^2$$

$$= \left| \langle + | \begin{bmatrix} 1 & 0 \\ 0 & e^{ix} \end{bmatrix} | 4^{\circ}i_u \rangle \right|^2.$$

$$I(x_0; x) = \underbrace{\langle 4^{\circ}i_u |}_{\frac{1}{2} \begin{bmatrix} 1 & 0 \\ 0 & e^{ix} \end{bmatrix}} \underbrace{[+x + \begin{bmatrix} 1 & 0 \\ 0 & e^{ix} \end{bmatrix}]}_{\frac{1}{2} \begin{bmatrix} 1 & e^{ix} \\ e^{-ix} & 1 \end{bmatrix}} \underbrace{(4^{\circ}i_u)}_{\frac{1}{2} \begin{bmatrix} 1 & e^{ix} \\ e^{-ix} & 1 \end{bmatrix}} = \frac{1}{2} X(x).$$

$$\begin{aligned} & I(x_0; 0) - I(x_0; \pi) \quad \mid I(x_0; \pi/2) - I(x_0; -\pi/2) \\ & = \frac{1}{2} \langle 4^{\circ}i_u | \{X(0) - X(\pi)\} | 4^{\circ}i_u \rangle \quad \mid = \frac{1}{2} \langle 4^{\circ}i_u | \{X(-\pi/2) - X(\pi/2)\} | 4^{\circ}i_u \rangle \\ & = \langle 4^{\circ}i_u | \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix} | 4^{\circ}i_u \rangle \quad \mid X(-\pi/2) - X(\pi/2) \end{aligned}$$

$$= 2 \operatorname{Re}(C_1 C_2^*) - \textcircled{*1} \quad \begin{aligned} & \mid = \langle 4^{\circ}i_u | \begin{bmatrix} 0 & -i \\ i & 0 \end{bmatrix} | 4^{\circ}i_u \rangle \\ & \text{where } \langle 4^{\circ}i_u \rangle = \begin{bmatrix} C_1 \\ C_2 \end{bmatrix} \quad \mid = 2 \cdot \operatorname{Im}(C_1^* C_2) - \textcircled{*2} \end{aligned}$$

*1 Interference emerging in Intensity

*2 ~~Interference~~ Hidden/Potential Interference,
 Since (Amplitude) = $\sqrt{(R_E)^2 + (I_m)^2}$

(2)

The 1st term of Re

$$\langle + | \pi_2 | 4^{\circ} \text{in} \rangle$$

$$I(x_0:0)$$

$$= \frac{\langle + | \pi_2 | 4^{\circ} \text{in} \rangle / I_0}{\cancel{I(x_0:0)} / I_0}$$

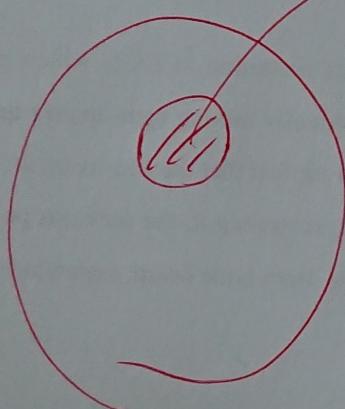
paths
on the way

$$I_0 = I_+ + I_-$$

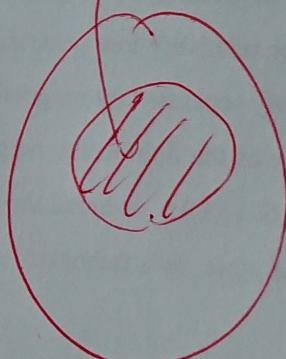
$$= I_+ + I_-$$

Exit of the IF

Prob(π_2)



Prob(+)



Relative Probability

between Prob(π_2) \leftrightarrow Prob(+) ??

WHAT IS THAT?