1) → ⊕ $\qquad$ <u>10.4.25</u> $\qquad$ $\lfloor 1$

14) $$W_j^R = |w_j|^2 + \frac{I(0) - I(\pi)}{4I(0)}$$

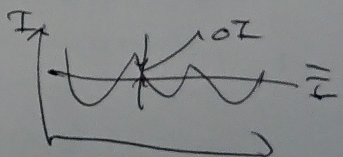
(15) $$\frac{I(\pi/2) - I(-\pi/2)}{4I(0)} = W_1^I = -W_2^I$$

6) $$w_j = \frac{\langle + | \hat{\pi}_j | \psi_{in} \rangle}{\langle + | \psi_{in} \rangle} = W_j^R + W_j^I$$

(8) $$|w_j|^2 = I_j / I(0) \qquad I_j = I_{\pm}^{Bl-k} \begin{pmatrix} k \leftrightarrow j \\ 1-2 \\ 2-1 \end{pmatrix}$$

14,18) → $$W_1^R = \frac{I_1}{I(0)} + \frac{\overset{2\Delta I}{I(0) - I(\pi)}}{4I(0)} \qquad ⊗\begin{cases} I(0) = \bar{I} + \Delta I \\ I(\pi) = \bar{I} - \Delta I \end{cases}$$

$$= \frac{1}{2I(0)} \cdot \left(2 I_1 + \Delta I\right)$$



$$= \frac{1}{2} + \frac{1}{2I(0)}\Big(-\underbrace{I(0)}_{-(\bar{I}+\cancel{\Delta I})} + 2I_1 + \cancel{\Delta I}\Big)$$

$$= \frac{1}{2} + \left(2I_1 - \bar{I}\right) / 2I(0) \qquad ⊗\ \bar{I} = I_1 + I_2$$

$$\Delta I_{12} = I_1 - I_2.$$

$$= \frac{1}{2} + \frac{I_1 - I_2}{2 \cdot I(0)} = \frac{1}{2}\left(1 + \frac{\Delta I_{12}}{I(0)}\right)$$

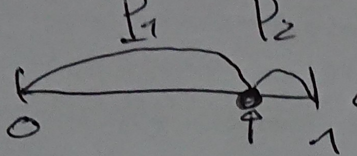
so, $$I_2^R = \frac{1}{2}\left(1 + \frac{\Delta I_{21}}{I(0)}\right).$$

$$\Delta I_{12} = -\Delta I_{21}$$

☆ $W_1^R = \frac{1}{2}\left(1 + \frac{I_1}{I(0)} - \frac{I_2}{I(0)}\right)$ 24.4.2025 | 2

Remark; $W_1^R = \frac{1}{2}(1 + P_1 - P_2)$

When $P_1 + P_2 = 1$, $W_1^R = \frac{1}{2}(P_1 + \cancel{P_2} + P_1 - \cancel{P_2})$



$= P_1$

$= (+1)P_1 + (0)\cdot P_2$

internal division point

$W_1^R = \frac{1}{2}(1 + P_1 - P_2)$

$$\begin{cases} P_1 = I_1/(I_1 + I_2 + \Delta I) \\ P_2 = I_2/(I_1 + I_2 + \Delta I) \end{cases}$$

$\rightarrow W_1^R = \frac{1}{2}\left(1 + \frac{I_1 - I_2}{I_1 + I_2 + \Delta I}\right)$

$= \frac{1}{2}\left(\frac{2I_1 + \Delta I}{I_1 + I_2 + \Delta I}\right)$

Quantum:

I) $W_1^R < 0$

$\frac{1}{2} \cdot \frac{2I_1 + \Delta I}{I_1 + I_2 + \Delta I} < 0$

$2I_1 + \Delta I < 0$

$2I_1 < -\Delta I$ …①

II) $1 < W_1^R$

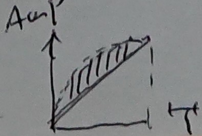
$1 < \frac{1}{2}\left(\frac{2I_1 + \Delta I}{I_1 + I_2 + \Delta I}\right)$

$2(\cancel{I_1} + I_2 + \Delta I) < \cancel{2I_1} + \Delta I$

$2I_2 + \Delta I < 0$

$2I_2 < -\Delta I$ ②

ΔI can be negative

①&② are  with stochastic Absorber