$$\left|P(a,c)-P(a,b)\right| \le \int [1-A(b,\lambda)\,A(c,\lambda)]\,d\lambda\,\rho(\lambda) = 1+P(b,c)$$

$$1+P(b,c) \ge \left|P(a,c)-P(a,b)\right| \qquad \vec{b}\simeq\vec{c} \qquad \theta_{bc}\simeq 0$$

$$1+P(b,c) \ge |b-c| \rightsquigarrow 1+P(b,c) \simeq |b-c| \rightsquigarrow P(\theta) \simeq |\theta| - 1 \qquad P_{min} = -1$$

$$P(\theta) = -\cos\theta$$

$P(a,b) \neq$ quantum mechanical.

$$\bar{P}(a,b) + a\cdot b \le |\bar{P} + a\cdot b| \le \epsilon + \delta$$

$$a=b \rightarrow \int d\lambda\,\rho(\lambda)[\bar{A}(b,\lambda)\bar{B}(b,\lambda)+1] \le \epsilon+\delta$$

$$1+\bar{P}(b,c)+\epsilon+\delta = 1+\bar{P}+b\cdot c - b\cdot c + \epsilon+\delta \le 1 + |\bar{P}+b\cdot c| + (\epsilon+\delta) \le 1 + 2(\epsilon+\delta) - b\cdot c$$

$$- b\cdot c$$

$$\underbrace{N_3+N_4}_{} \le (N_2+N_4)+(N_3+N_7) \quad \div \sum^{8} N_i$$

$$P(a+;b+) \le P(a+,c+) + P(b+,c+)$$

$$P(a+,b+) \rightsquigarrow P(S_1\cdot a+,\ S_1\cdot b-) = P(S_1\cdot a+)\cdot P(S_1\cdot b- \mid S_1\cdot a+) = \frac{1}{2}\cdot\sin^2\frac{\theta_{ab}}{2}$$

$$\sin^2\frac{\theta_{ab}}{2} \le \sin^2\frac{\theta_{bc}}{2} + \sin^2\frac{\theta_{ac}}{2} \qquad \theta_{bc}=\theta_{ac}=\theta,\ \theta_{ab}=2\theta, \qquad \theta_{ab}=\frac{\pi}{4} \qquad \theta=\frac{\pi}{8}$$

$$0.5 \le 0.16\times 2 = 0.32 \ \text{※}$$

برهان رابطهٔ استفاده شده:

$$P(S_1\cdot b=+ \mid S_1\cdot x=-) = |\langle S_1\cdot b+|S_1\cdot x-\rangle|^2 :$$

$$S_1\cdot b = b_x S_x + b_y S_y + b_z S_z = \frac{\hbar}{2}(\sigma_x\cos\theta - \sigma_y\sin\theta)$$

$$\begin{bmatrix} 0 & \cos\theta+i\sin\theta \\ \cos\theta - i\sin\theta & 0 \end{bmatrix}\begin{bmatrix} x \\ y\end{bmatrix} = \begin{bmatrix} \alpha \\ y\end{bmatrix} \rightarrow \begin{bmatrix} x \\ y\end{bmatrix} = \frac{1}{\sqrt{2}}\begin{bmatrix} e^{i\theta} \\ 1\end{bmatrix}$$

$$P = |\langle S_1\cdot b+|S_1\cdot x-\rangle|^2 = \left(\frac{1}{2}\right)^2\left([1\ \ -1]\begin{bmatrix} e^{i\theta} \\ 1\end{bmatrix}\right)\left([1\ \ -1]\begin{bmatrix} e^{-i\theta} \\ 1\end{bmatrix}\right) = -\frac{e^{i\theta}-1}{2} \quad \frac{1-e^{i\theta}}{2} = \sin^2\frac{\theta}{2}$$