

$$\begin{aligned}
\frac{2s}{\pi\alpha^2} \frac{d\sigma}{d\cos\theta} (e^+e^- \rightarrow f\bar{f}) &= \left| \frac{1}{1-\Delta\alpha} \right|^2 (1 + \cos^2\theta) \\
&+ 4\text{Re} \left\{ \frac{2}{1-\Delta\alpha} \chi(s) [\hat{g}_\nu^e \hat{g}_\nu^f (1 + \cos^2\theta) + 2\hat{g}_a^e \hat{g}_a^f \cos\theta] \right\} \\
&+ 16 |\chi(s)|^2 \left[ (\hat{g}_a^e{}^2 + \hat{g}_\nu^e{}^2) (\hat{g}_a^f{}^2 + \hat{g}_\nu^f{}^2) + 8\hat{g}_a^e \hat{g}_a^f \hat{g}_\nu^e \hat{g}_\nu^f \cos\theta \right]
\end{aligned}$$

$$e^+e^- \rightarrow Z^0 \rightarrow I\bar{I}, q\bar{q}$$

$$|\vec{a} \cdot \vec{b}| = \Sigma a_{jk}^i + b_i^{bj}$$

$$i(\partial_\mu \bar{\psi} \gamma^\mu + m\bar{\psi}) = 0 \Leftrightarrow (\square + m^2)\psi = 0$$

$$L_{em} = eJ_{em}^\mu A_\mu, J_{em}^\mu = \bar{I}\gamma_\mu I, M_i^j = \sum A_\alpha \tau_i^{\alpha j}$$