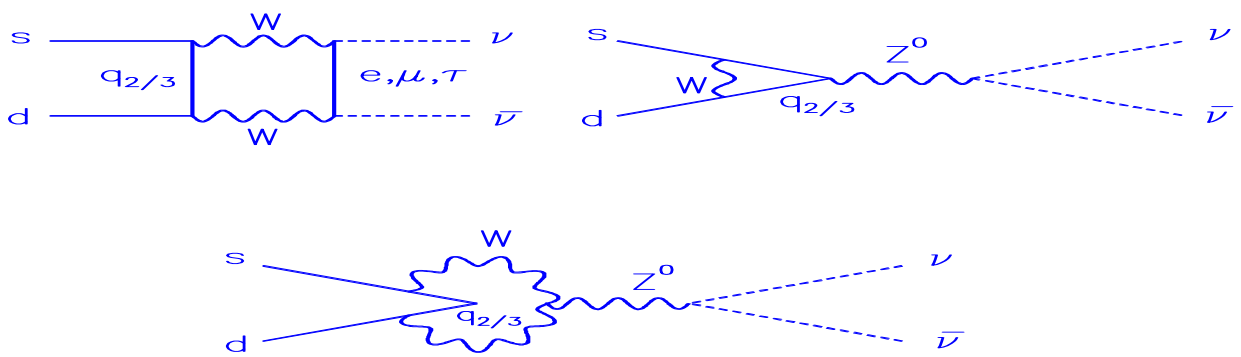
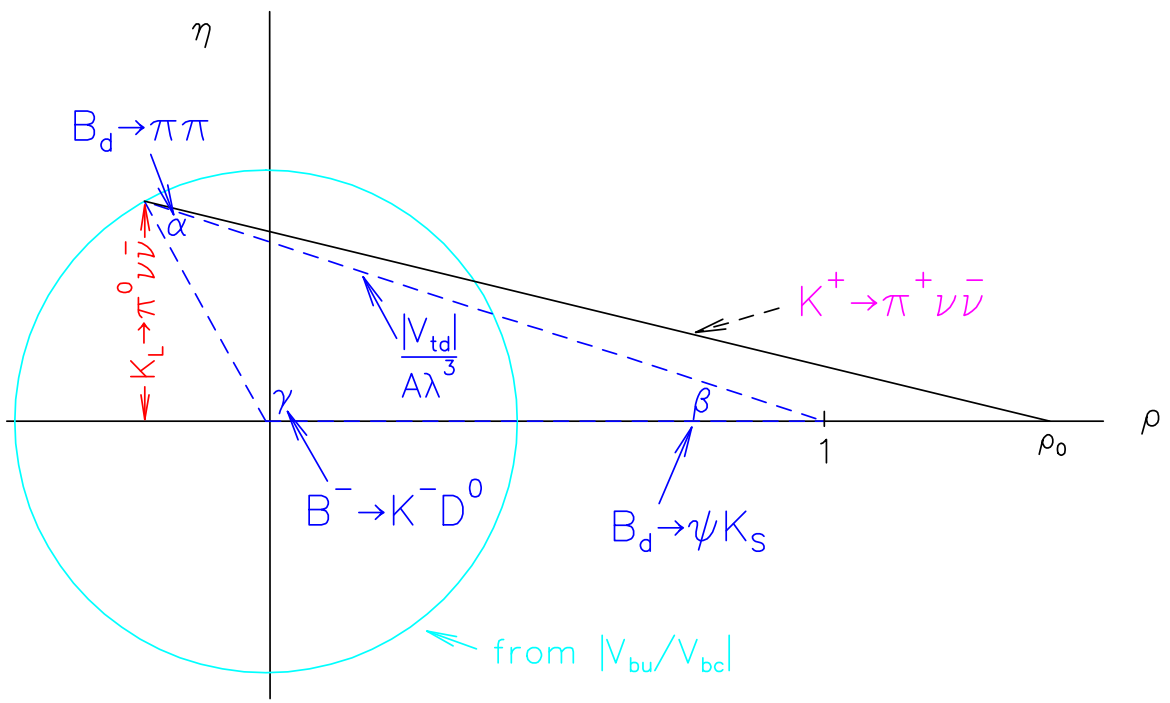
$K^o \to \pi^o \nu\bar{\nu}$ in the Standard Model



- Pure direct CP-violating.
- Calculation in terms of fundamental parameters good to $\sim 1\%$.

$$
\begin{aligned}
B(K_L \to \pi^o \nu\bar{\nu}) &= \frac{\tau_{K_L}}{\tau_{K^+}} \frac{\alpha^2 B(K^+ \to \pi^o e^+ \nu)}{V_{us}^2 2\pi^2 sin^4\theta_W} \sum_l |ImV_{ts}^* V_{td} X(x_t)|^2 \\
&= 1.56 \times 10^{-4} [Im(V_{ts}\ ^* V_{td}\ )]^2 \equiv 1.56 \times 10^{-4} [Im\lambda_t]^2 \\
&= 4 \times 10^{-10} A^4 \eta^2 \sim 3 \times 10^{-11}
\end{aligned}
$$

- $Im\lambda_t$ presently known to $\sim 22\%$, E926 will get to $\sim 7\%$.
- There are only a few solid measurements. $\longrightarrow$ None is better!