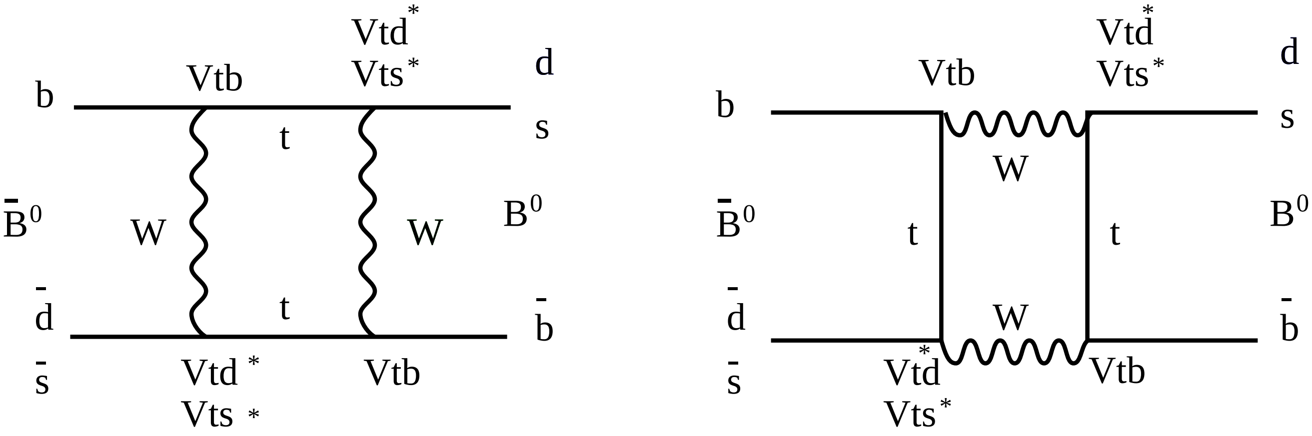
$B^0\bar{B}^0$ within the SM

- $B^0\bar{B}^0$: due to box diagrams
- top quark exchange dominates
- Δm_d and Δm_s can be computed (but large uncertainties due to QCD corrections)



$$\Delta m_q = \frac{G_F^2}{6\pi^2}|V_{tb}|^2|V_{tq}|^2 M_W^2 M_{B_q^0} f_{B_q^0}^2 B_{B_q^0} \eta_{B_q^0} S\left(\frac{M_t^2}{M_W^2}\right)$$

Main theoretical uncertainties coming from :

- $f_{B_q^0}$: B_q^0 pseudo-scalar decay constant $f_{B_q^0} \simeq 200 \pm 40$ MeV
- $B_{B_q^0}$: Bag factor $B_{B_q^0} = 1.0 \pm 0.2$

$\rightarrow$ interest of the ratio :

$$\frac{\Delta m_d}{\Delta m_s} = \frac{|V_{td}|^2}{|V_{ts}|^2}\frac{M_{B_d^0}}{M_{B_s^0}}\frac{f_{B_d^0}^2 B_{B_d^0}}{f_{B_s^0}^2 B_{B_s^0}}$$

with $\frac{f_{B_d^0}^2 B_{B_d^0}}{f_{B_s^0}^2 B_{B_s^0}} = \xi_s = 1.16 \pm 0.10$ (SU(3) flavor symmetry breaking)