

Decay width for $H \rightarrow f\bar{f}$

Calculate the partial decay width of a Higgs boson into a pair of fermions, $f\bar{f}$, with mass m_f .

Evaluate $\Gamma(H \rightarrow f\bar{f})$ for $f = b, \tau, \mu$.

Landau pole

The RGE for the running Higgs self coupling is given by (1-loop order)

$$Q^2 \frac{d\lambda}{dQ^2} = \beta(\lambda) = \frac{3}{4\pi^2} \lambda^2$$

Determine $\lambda(Q^2)$ with the boundary condition

$$\lambda(v^2) = \frac{M_H^2}{2v^2}.$$

At which scale $Q = \Lambda_c$ does $\lambda(Q)$ diverge for $M_H = 125$?

