

8.811 Particle Physics
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Reading: Q&L Chap 13, 14 and 15

Assignment 5

Due Dec 2, 2005

1. Compute the ratios of the decay widths of
 - a) $\phi \rightarrow K^+ K^-$ to $\phi \rightarrow K_S^0 K_L^0$ (ignore the phase space factor),
 - b) $K_S^0 \rightarrow \pi^+ \pi^-$ to $K_S^0 \rightarrow \pi^0 \pi^0$ (use $\Delta I = 1/2$ rule), and
 - c) Higgs $\rightarrow W^+ W^-$ to Higgs $\rightarrow Z^0 Z^0$(Explain why, besides the mass factor, the couplings of Higgs to $W^+ W^-$ is a factor of $\sqrt{2}$ larger than that of Higgs to $Z^0 Z^0$).
2. Q&L 13.4
3. Q&L 13.6
4. Q&L 14.1
5. Q&L 14.2
6. Q&L 14.13
7. Compute and tabulate the Higgs coupling constants using 15.40 of Q&L and show that they are the same as we obtained earlier using unitarity.