

Physics 3: Particle Physics Corrections

Lecture 1, slide 15: 4th line in the baryon part of the table. Should read neutron (udd) (NOT ddd)!

Lecture 2, slide 6: last line of equation. Should be 2 in front of last two terms:

$$= (m(\pi^+))^2 + (m(\pi^-))^2 + 2E(\pi^+)E(\pi^-) - 2\vec{p}(\pi^+) \cdot \vec{p}(\pi^-)$$

Lecture 2, slide 10: Following equation should read (sign is wrong on last term):

$$(\underline{p}_b)^2 = (\underline{p}_A)^2 + (\underline{p}_d)^2 - 2\underline{p}_A \cdot \underline{p}_d$$

Lecture 3, slide 2 & slide 11: In both the Schödinger equation and the Klein-Gordon equation the first $\hbar$ on the LHS, should be squared.

Lecture 3, slide 5: Under the Feynman diagram, $\mathcal{M}$ is just proportional to the expression:

$$\mathcal{M} \propto e \cdot 1/\underline{q}^2 \cdot e$$

Lecture 3, slide 12: In the first summary box, first bullet point should be: “a negative energy particle travelling backwards in time”. (Not a positive energy one).

Lecture 5, slide 6: The bottom table should have the strange quark *strangeness* -1, not the down quark.

Up	+2/3	$ \frac{1}{2}, +\frac{1}{2}\rangle$	0
Down	-1/3	$ \frac{1}{2}, -\frac{1}{2}\rangle$	0
Strange	-1/3	$ 0, 0\rangle$	-1

Lecture 6, Slide 12: Under the Feynman diagrams it should read: “For one type of quark,

$$R = \frac{Q_q^2 e^4 / \underline{q}^4}{e^4 / \underline{q}^4} = Q_q^2$$

Some of the powers are wrong.

Lecture 8, Slide 15: Final equation should be:

$$\frac{\Gamma(K^+ \rightarrow \mu^+ \nu_\mu)}{\Gamma(\pi^+ \rightarrow \mu^+ \nu_\mu)} = \frac{V_{us}^2}{V_{ud}^2} = 0.055$$

Numerator on second fraction should be V_{us}^2

Lecture 9, Slide 2: “We’ve seen already that wherever a γ boson can be exchanged a Z can also be exchanged” (need to swap γ and Z : subtle, but important, difference in meaning)