PHY397K - NUCLEAR PHYSICS - 11

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Spring 2015, Unique numbers: 57115
RLM 5.116, TTH 12:30 - 2:00 pm

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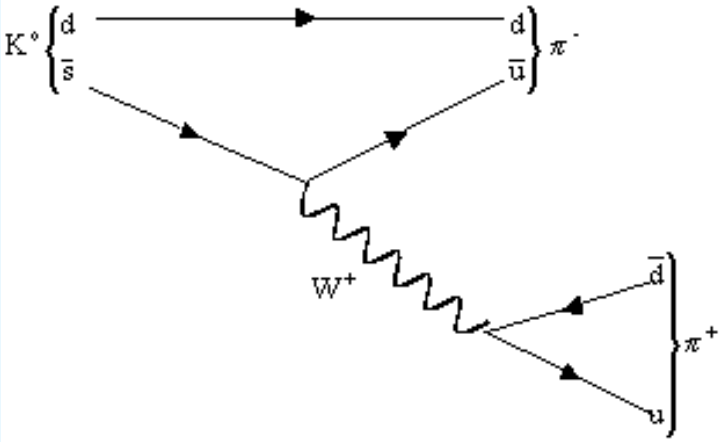
Homework I

$K^0 \rightarrow \pi^+ + \pi^-$

$d \rightarrow d$

$\bar{s} \rightarrow \bar{u}$ with the creation of an antidown - up pair.



This is a weak decay of the anti-strange quark. It is an allowed diagonal change between anti-quark generati

The Feynman diagram shows a combination of an antiquark-weak vertex and a quark-weak vertex.

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Homework I

$\Lambda^0 \rightarrow p + \pi^-$

In this case a lambda zero decays to a proton and a pi-minus via the weak interaction.

The quark analysis shows:

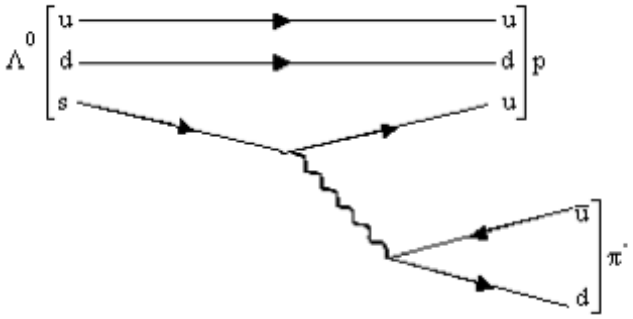
$\Lambda^0 \rightarrow p + \pi^-$

u ® u

d ® d

s ® u with the creation of a down - antiup pair.

The corresponding Feynman diagram will be:



This is a weak decay of the strange quark. It is an allowed diagonal change between quark generations.

Homework II

number charge px py pz
0 1 0.464102 0.264722 -1.24016
1 1 0.446524 0.275066 0.582579
2 1 0.196947 -0.0297039 -0.396095
3 1 0.0237435 0.112199 0.172602
4 1 0.705675 0.181663 0.66665
5 1 0.0732284 0.139458 0.20041
6 1 0.150761 0.111825 -0.118535
7 1 0.196296 0.329958 0.238096
8 1 0.632848 0.237168 1.03834
9 1 0.695853 0.27376 -0.227177
10 1 0.311155 -0.000994248 0.0337615
……

100 pions: (50 positive and 50 negative pions)
Question: How many K0 are in this sample

macro: read in ascii file basic.C