Homework 2-1   Homework Assignment

Particle Detectors

Modern Particle Physics (2nd Edition) by Mark Thomson

Problems: 2.1,   2.2,   2.3,   2.4,   2.5,   2.7,   2.8,   2.9

In problem 2.8, the reaction should be $pp \rightarrow pp\bar{p}p$

1.xx   A K^+ meson decays at rest in the laboratory frame. $K^+ \rightarrow \mu^+ \nu_\mu$

a.   Draw the Feynman diagram for this decay. Make sure you get your arrows in the correct direction. **Hint:** This is a weak interaction.

b.   Using momentum 4-vectors, calculate the momentum of the μ⁺ lepton.

1.yy   A beam of π^- mesons are incident on a "proton target" and undergo the following reaction: $\pi^- p \rightarrow K^o \Lambda^o$

a.   Draw the Feynman diagram for this reaction. **Hint:** This is a strong interaction.

b.   Using momentum 4-vectors, calculate the threshold energy (i.e., minimum KE of the π^-) for producing a Λ^o baryon.

Due Date: **September 19, 2017**   **(Tuesday)**