

Physics 556/714 Problem Set #7

due *beginning of class* Thursday Nov. 6

Reminder: The PDG listings for all known particles are available at http://pdg.lbl.gov/2003/contents_listings.html

1. Griffiths problem 7.6: "If the z axis points along the direction of motion..."
Do the calculation only for $u^{(1)}$, $u^{(2)}$, $u^{(3)}$ and $u^{(4)}$. (The $v^{(i)}$ are trickier, as we noted in class.)
2. Griffiths problem 7.8: "[The purpose of this problem ...]"
For part d) use the u spinors of equation 7.46 and don't worry about the v spinors of equation 7.50.
3. Griffiths problem 7.22: "Using $u^{(1)}$, $u^{(2)}$ (7.46) and $v^{(1)}$, $v^{(2)}$ (7.50), ..."
Do only the completeness relations for the u spinors. Don't bother with the v spinors.
4. Griffiths problem 7.27 "(a) Show that ..." and "(b) If Γ is any product ..."

714 students please also do the following:

5. The figure below shows a Dalitz plot for the decay $D^0 \rightarrow K^- \pi^+ \pi^0$.
Explain the physics behind the following features of the plot:
 - a) the horizontal band marked A
 - b) the vertical band marked B
 - c) the diagonal band marked C
 - d) Why are all three bands dense at the edges of the plot and sparse in the centers?
 - e) Why is there a gap in the overlap of the horizontal and vertical bands (outlined by rectangle)?
 - f) Why is the gap oriented at an angle (lower left to upper right) across the overlap region?

