The problems for this set have all been taken from Robinett and include problems from chapters 5, 6 and 7 of Robinett. That the problems come from 3 chapters seems a bit excessive for a homework covering only two weeks of lecture, but there is only one problem from chapter 7 and that one could be solved to great degree with only material from chapter 6. Eight problems seems like a lot as well, but three of these problems are Robinett’s Q problems, rather than his P problems. The Q problems are more essay problems than plug and chug problems. It is a good thing sometimes to sit and think rather than just grind. I will try to keep two week assignments to 5 grind problems or less.

We are and will continue to use examples from electromagnetism to try to bring out salient features of quantum theory. Here is a quite basic problem treated in almost any place where electromagnetism is treated:

1. Answer Q5.1 on page 104 of Robinett.

   Here is a problem designed to make you carry out just the calculation he is doing in the book, but then, it is calculation that you should know how to make:

2. Do P5.1 on pages 105 of Robinett.

   Here is a two level system problem in one of its simplest forms:

3. Do P5.16 on page 108 in Robinett.

   The shape of a potential function can have a lot to say about time variation of ringing solutions in that potential. Oftentimes, quantum decoherence does away with any form of ringing, but here is something to think about when things don’t decohere, and they don’t always:


   This is a good question that appears again in the text by Schleich in the form of a whole chapter:

5. Give an answer to Q6.14 on page 108 of Robinett.

   The simple harmonic oscillator is a good approximate model for a lot of quantum mechanical things, and an exact model for the energy in an electromagnetic field. We will see it again and again in this course, so here is a first view:

6. Do P6.3 on page 129 of Robinett.

   Here is a square well problem designed to illustrate some aspects of a two level system. A system such as the one that you are treating here, that is, one that consists of an even and an odd function, resembles the roughly two level systems that gives rise to the index of refraction of polarizable media:
7. Do P6.15 on page 129 of Robinett.

In class we talked about initial value problems on strings. Here is one that you can work out analytically that is not even too unrealistic an initial condition for a string (or jump rope):

8. Do P7.6 on page 153 of Robinett.