PHYS 621 – HOMEWORK # 8 – DUE FRIDAY, 10/30/2009

Problem 1. Jackson problem 4.1

Problem 2. Jackson problem 4.2

Problem 3. A nucleus with quadrupole momentum Q is placed in an external electric field $\mathbf{E} = (E_x, E_y, E_z)$. Show that the quadrupole contribution to the energy is

$$W^{(4)} = -\frac{e}{4} Q \left[\nabla_z E_z \right]_{\mathbf{x}=0}.$$

(For notations, see discussion below Eq. (4.24), Jackson Sect. 4.2.)