PHYC 511: Electrodynamics

Spring 2019

Homework Assignment #7

(Due April 17, 2019)

1-Two identical charges q are on the opposite ends of a rigid rod of length $2a$. The rod is seto to rotation about a frictionless pivot at its center at frequency ω_0. The rotation takes place about a fixed axis orthogonal to the rod. Assume that the wavelength of emission is long compared to a.

(a) Show that the lowest order radiating multipole is an electric quadrupole, not an electric or magnetic dipole. Find the time-dependent components of the quadrupole-moment tensor.

(b) Calculate the time averaged rate of emission from this system.

2- Problem 9.3, Jackson.

3- Problem 9.14, Jackson.

4- Problem 9.16, Jackson.