

PHYC 511: Electrodynamics

Spring 2018

Homework Assignment #7

(Due April 30, 2018)

1-Two identical charges q are on the opposite ends of a rigid rod of length $2a$. The rod is set 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.