

ELECTRODYNAMICS
PROBLEM SET 10
due April 20th, before class

Rotating dipole

Consider an electric dipole \vec{p} spinning around an axis forming an angle θ with \vec{p} . Compute the power radiated as a function of the direction and the total power radiated.

Two dipoles

Compute the power radiated as a function of the direction and the total power radiated by two oscillating parallel dipoles of equal magnitude and a phase difference δ . Comment on how we can direct the radiation in different directions by changing δ .

Coaxial cable

A coaxial cable is made of two cylindrical conductors, one inside the other. Show that in coaxial cables one can have TEM modes. What is the velocity of waves in the TEM mode?