

Physics 425, Spring 2012:

Assignment set #10

Due March 21:

23. Griffiths Problem 11.9: you should

- (a) find the electric dipole moment of this setup (review Chap 3.4.2 on how to calculate the dipole moment);
- (b) calculate the electric and magnetic fields;
- (c) calculate the power radiated.

Due March 23:

24. The radiation resistance is defined by $R = P_{avg}/I_{rms}^2$.

- (a) Griffiths Problem 11.3: find the radiation resistance of a point electric dipole.
- (b) Griffiths Problem 11.6: find the radiation resistance of a point magnetic dipole

Due March 26:

25. An oscillating electric dipole has the magnitude $p = p_0 \cos(\omega t)$, and its direction is given by the position angle $\theta' = 60^\circ$ and $\phi' = 45^\circ$ in the spherical coordinates. The dipole is placed at the origin.

- (a) At the position $\vec{r} = \hat{x} + 2\hat{y} + 2\hat{z}$, what is the unity vector that indicates the direction of the radiation Poyning flux \vec{s} ?
- (b) find the magnitude of \vec{s} .