

2 Electric Field of a Charge Distribution

2.1 Lecture Notes

- $\lambda \neq$ to wavelength, but linear charge density (charge per length).
- Arc length is angle (radians) times radius ($S = r\theta$).
- No two field lines can cross.

2.2 Recitation

- Because in nature, point charges are not common, we do a distributed charges.
 - We do this via superposition (i.e. add up vectorily to get the total charge).
- Suppose you have a rod, and an origin at the center, and a point h distance at the origin.
 - $dE_x = dE \sin \theta$
 - Likewise, $dE_y = dE \cos \theta$

$$dE_y = dE \cos \theta \tag{1}$$

$$= \frac{k\lambda dx}{r^2} \frac{h}{r} \tag{2}$$

- This is one of two charge distribution we often encounter.
 - Still the same process.