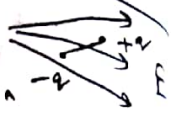


Electric dipole in a non uniform electric field.

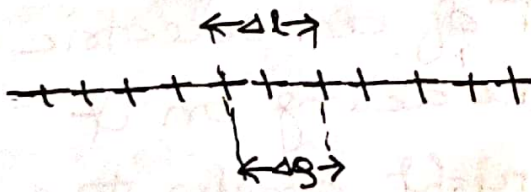
When a dipole is placed in a non-uniform electric field, the two constituent charges, in spite of being equal in magnitude do not experience equal forces as, at the two ends there is two different electric field strength. Thus a dipole, in a non-uniform field experiences a resultant force in addition to the torque experienced by it.



Continuous charge distribution

the linear charge density (λ). λ is

defined by $\lambda = \frac{\Delta Q}{\Delta L}$ where ΔL



is a small line element of wire and ΔQ is the charge contained in that line element. Unit

of λ is Coulomb/m.

Gauss's law in electrostatics 43

Gauss's theorem states that the total electric flux through a closed surface is $\frac{1}{\epsilon_0}$ times the net charge enclosed by the closed surface.

Mathematically we can write

$$\Phi_E = \oint_S \vec{E} \cdot d\vec{S}$$

$$= \frac{q}{\epsilon_0}$$

if charge is inside the closed surface.

and $\Phi_E = 0$

if charge is outside the closed surface.

