NPRE 321 Lecture 1 Note

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What is a plasma?

- **ionized gas/matter**

  plasma are not nessesarily gasses in atmosphere of sun it could be as dense as 1/2 of water.

- **quasi neutral**

  it is electricly neutral macroly and not nessesarily neutral microly

- **Hot**

Fun Facts

room temperature measured in eV is about $\frac{1}{40}eV$. Pressure plasma is about 1-2 eV. Fusion plasma at $10keV$.
In cases of fusion, plasmas are in stats of:

- low density (10^{-5} tor *as height of mercury)
- high temperature ($10keV$)
- energy losses are majorly because of photons

Gauess Law

$$F = qE$$

,

$$E = \frac{q}{4\pi\varepsilon_0 r^2}$$

$$F = \frac{q_1 q_2}{4\pi\varepsilon_0 r^2}$$

note that

$$F = ma$$

Therefore

$$a = F/m = \frac{q_1 q_2}{4\pi\varepsilon_0 r^2 m}$$

Thus, for a point charge moving in a electric field E, there is:

$$y = y_0 + v_{0y} \cdot t + \frac{1}{2} at2$$