Eletromagnetismo

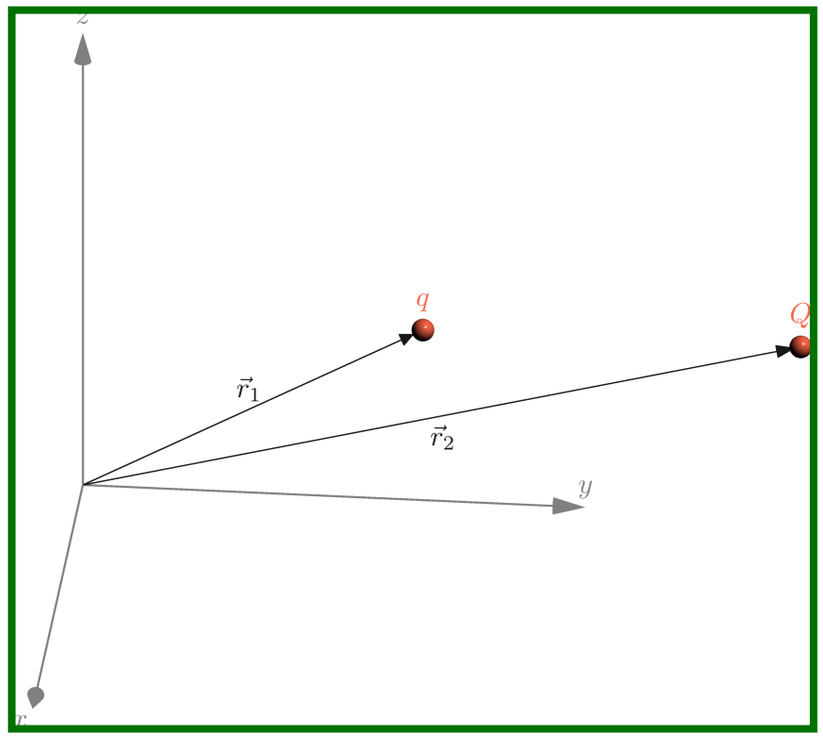
18 de abril

Eletrostática

Eletrostática

Lei de Coulomb

$$\vec{F} = \frac{1}{4\pi\epsilon_0}\frac{qQ}{r^2}\hat{r}$$



$$\epsilon_0 = 8.85 \times 10^{-12}\,\frac{\mathrm{C}^2}{\mathrm{Nm}^2}$$

$$\vec{r} = \vec{\mathbf{r}}_2 - \vec{\mathbf{r}}_1$$

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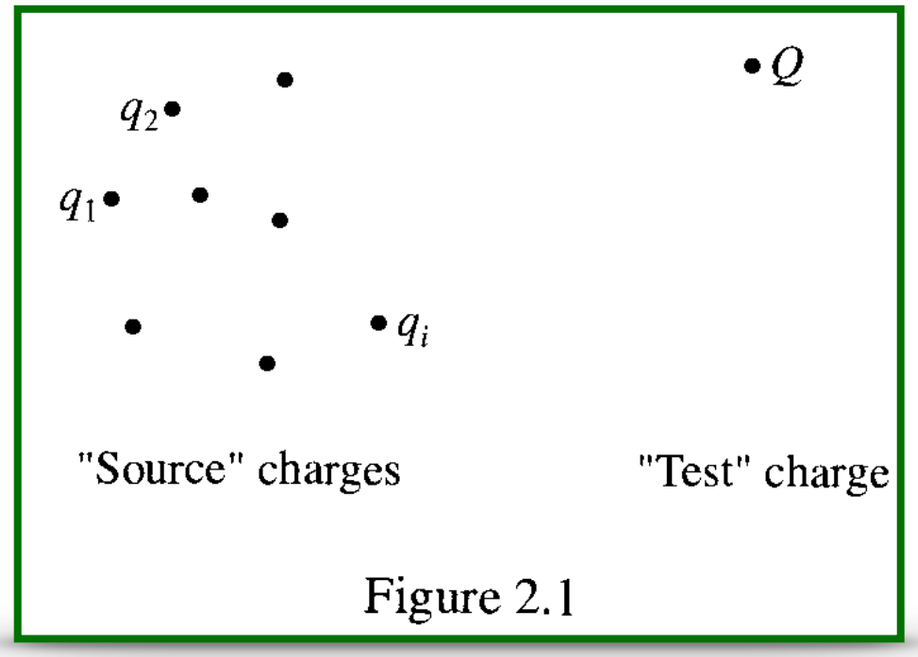

Figure 2.1

$$\epsilon_0 = 8.85 \times 10^{-12}\frac{\mathrm{C}^2}{\mathrm{Nm}^2}$$

$$\vec{r} = \vec{R} - \vec{r}$$

$$\vec{F} = \frac{1}{4\pi\epsilon_0}Q\sum_i \frac{q_i\vec{r}_i}{r_i^3}$$

Eletrostática

Campo elétrico

$$\vec{F} = \frac{1}{4\pi\epsilon_0} Q \sum_i \frac{q_i \vec{r}_i}{r_i^3}$$

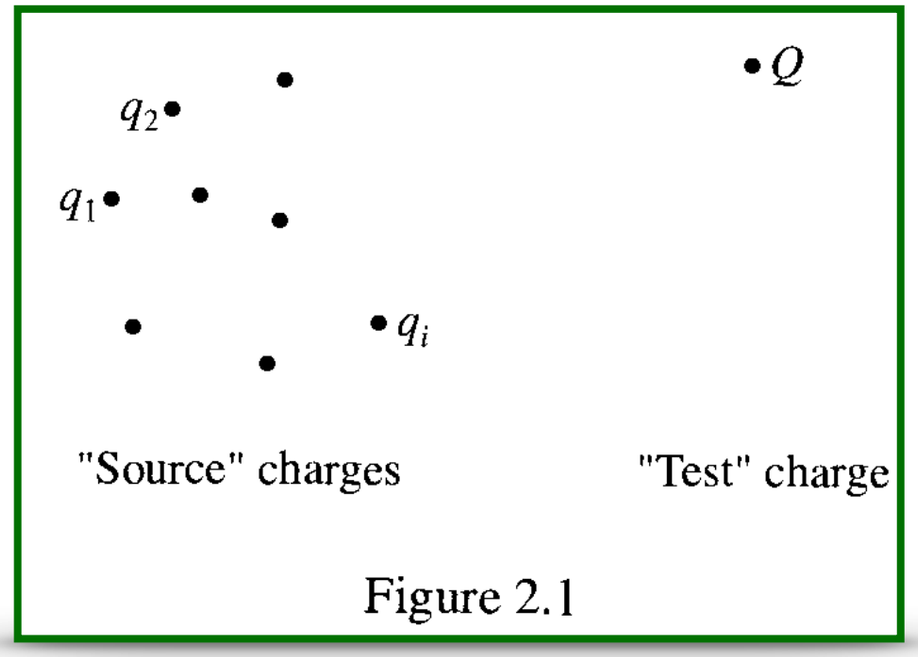

Figure 2.1

Eletrostática

Campo elétrico

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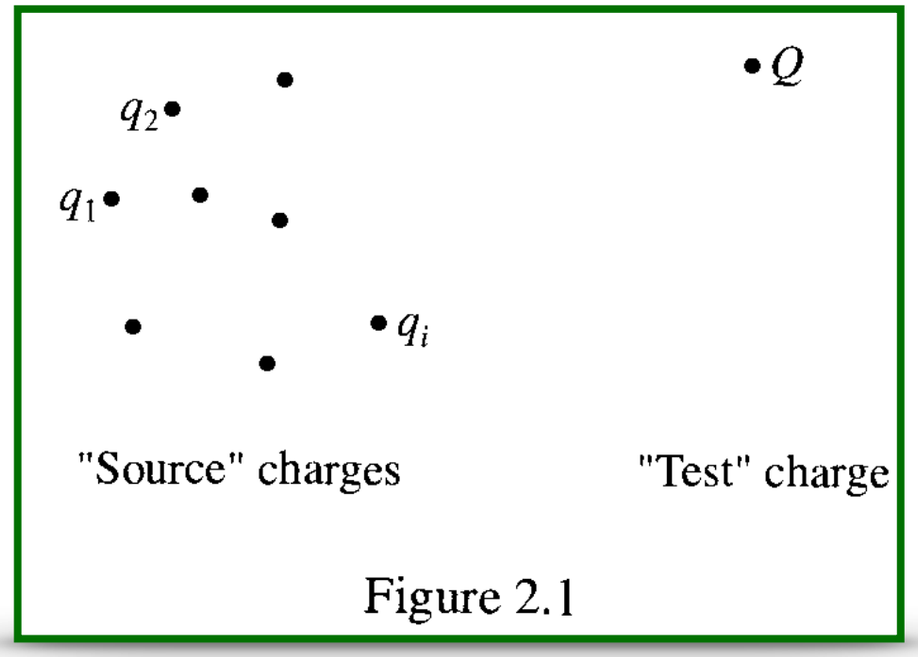


Figure 2.1

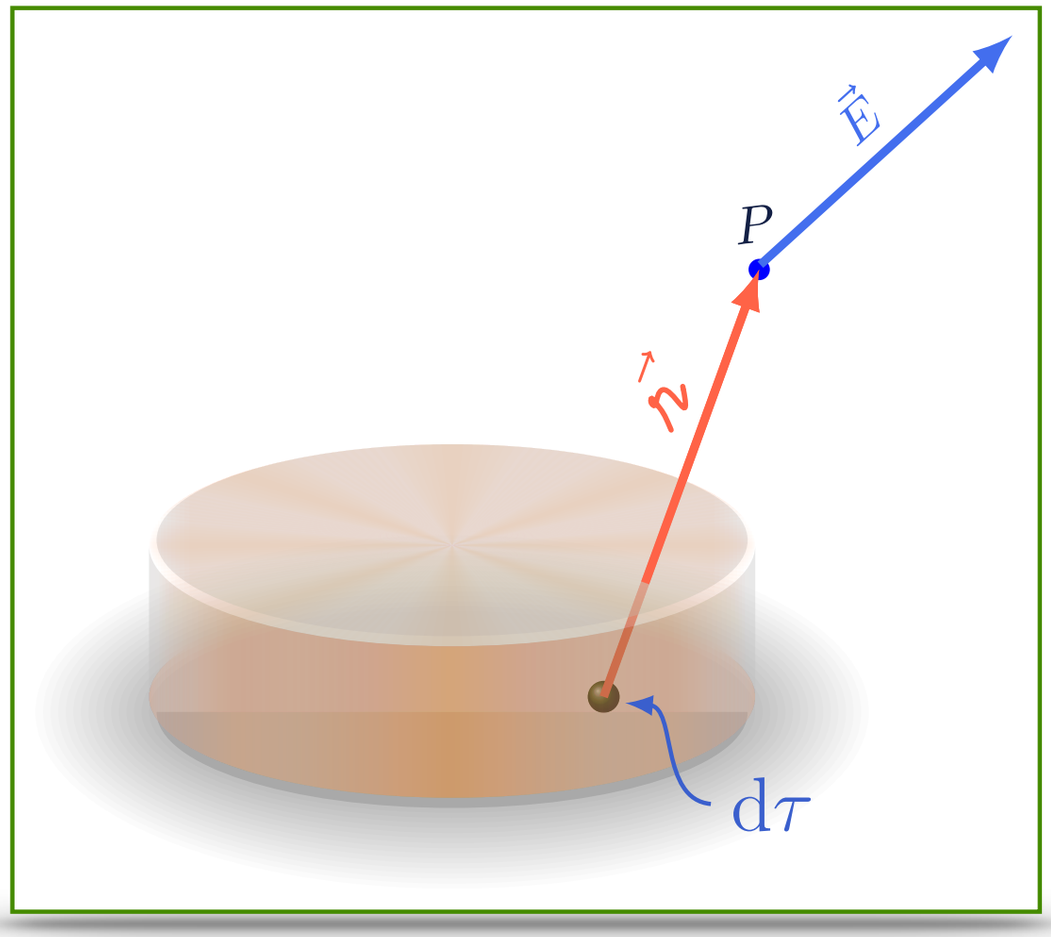
$$\vec{E} = \frac{1}{4\pi\epsilon_0} \sum_i \frac{q_i \vec{r}_i}{r_i^3}$$

$$\vec{F} = Q\vec{E}$$

Eletrostática

Distribuição de cargas

$$\vec{E} = \frac{1}{4\pi\epsilon_0} \sum_i \frac{q_i \vec{r}_i}{r_i^3}$$



Eletrostática

Distribuição de cargas

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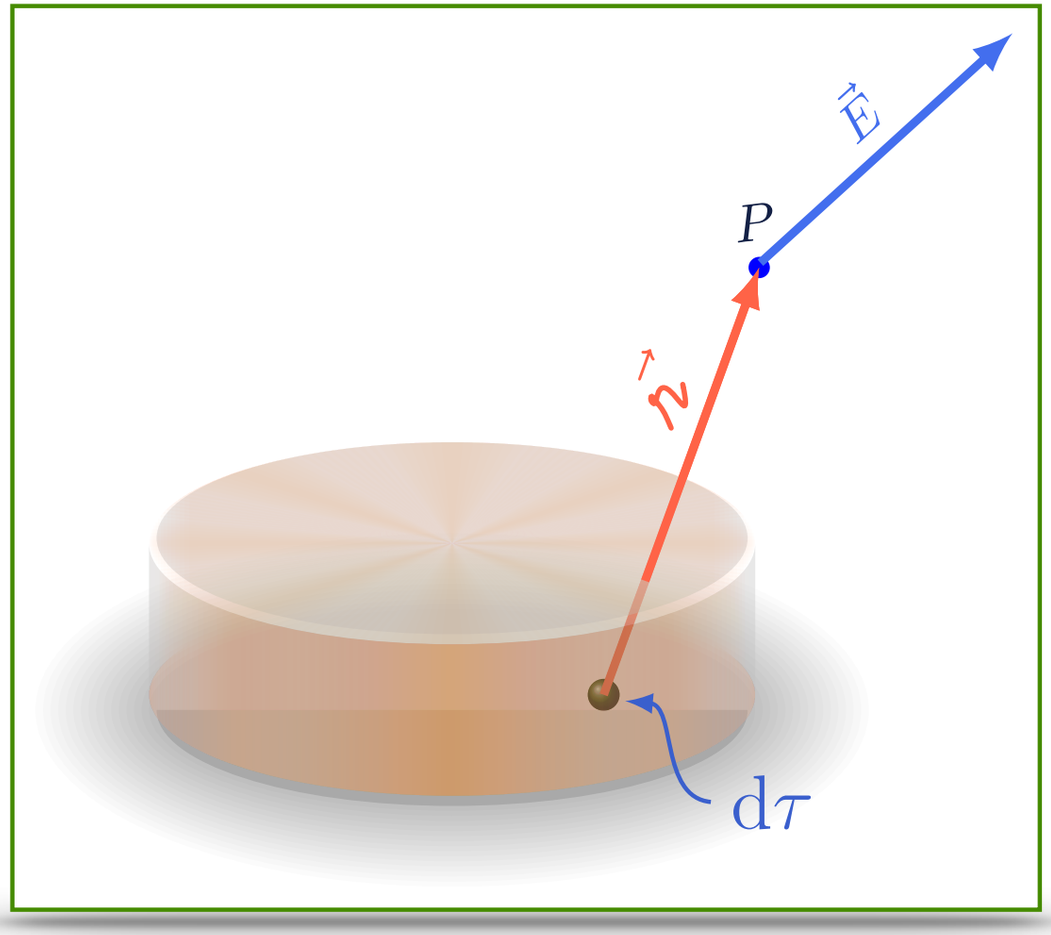
$$\vec{E} = \frac{1}{4\pi\epsilon_0} \int \frac{1}{r^2} \hat{r}\, \mathrm{d}q$$



Eletrostática

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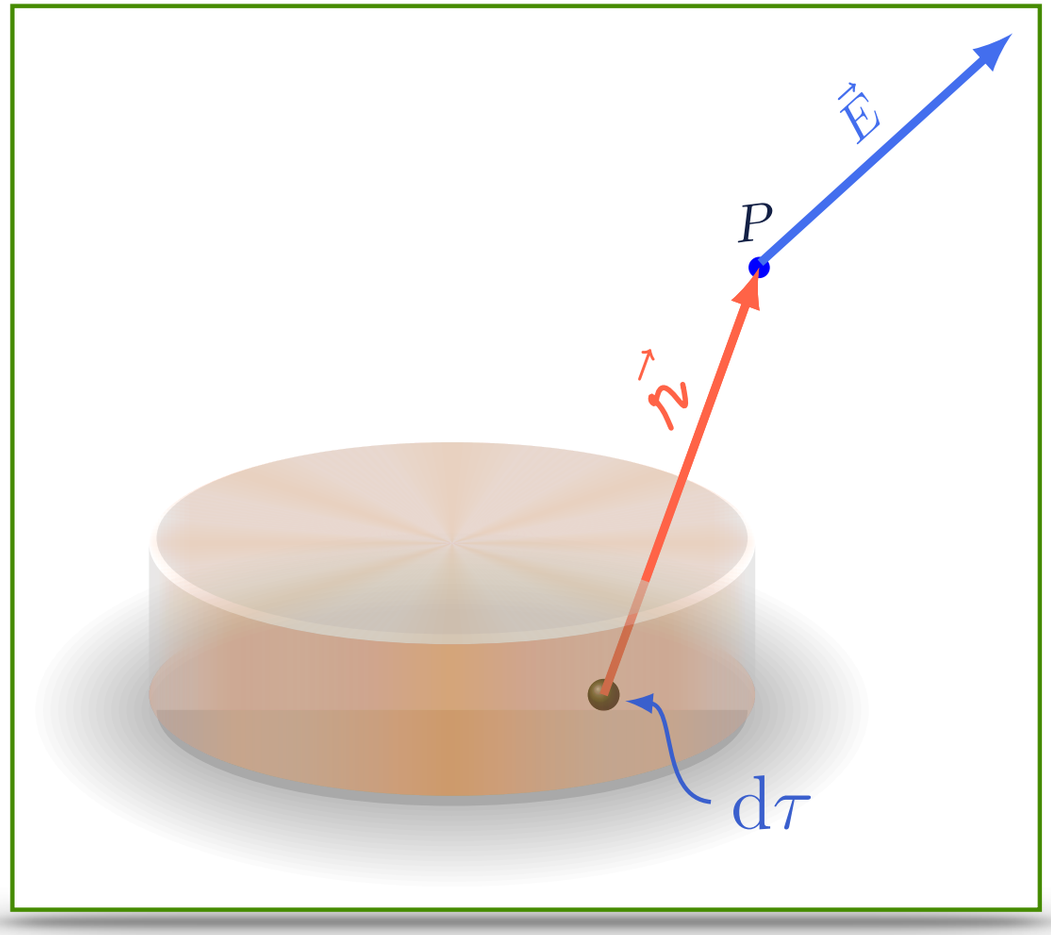

$$\mathrm{d}q = \begin{cases} \lambda\, \mathrm{d}\ell & \text{(linear)} \\ \sigma\, \mathrm{d}A & \text{(superficial)} \\ \rho\, \mathrm{d}\tau & \text{(volumétrica)} \end{cases}$$

Eletrostática

Exemplo: Distribuição superficial

$$\vec{E} = \frac{1}{4\pi\epsilon_0}\int \frac{1}{r^2}\hat{r}\,\mathrm{d}q$$

$$\mathrm{d}q = \rho(\vec{r})\;\mathrm{d}\tau$$

$$\rho(\vec{\mathbf{r}}) = ?$$