Magnetoestática

$$\boldsymbol{B} = \boldsymbol{\nabla} \times \boldsymbol{A} \tag{1}$$

$$\boldsymbol{F}_m = I \int (\boldsymbol{dl} \times \boldsymbol{B}) \tag{2}$$

$$\boldsymbol{A}(\boldsymbol{r}) = \frac{\mu_0}{4\pi} \int_V \frac{\boldsymbol{j}(\boldsymbol{r}')}{|\boldsymbol{r} - \boldsymbol{r}'|} dv' \tag{3}$$

$$\boldsymbol{A}(\boldsymbol{r}) = \frac{\mu_0 I}{4\pi} \int_C \frac{1}{|\boldsymbol{r} - \boldsymbol{r}'|} d\boldsymbol{l}' \tag{4}$$

$$\boldsymbol{B}(\boldsymbol{r}) = \frac{\mu_0}{4\pi} \int \frac{\boldsymbol{j}(\boldsymbol{r}') \times (\boldsymbol{r} - \boldsymbol{r}')}{|\boldsymbol{r} - \boldsymbol{r}'|^3} dv' \tag{5}$$

$$\boldsymbol{B}(\boldsymbol{r}) = \frac{\mu_0}{4\pi} I \int \frac{d\boldsymbol{l}' \times \hat{\boldsymbol{s}}}{s^2} \qquad \boldsymbol{s} = \boldsymbol{r} - \boldsymbol{r}' \tag{6}$$

$$\oint \boldsymbol{B} \cdot d\boldsymbol{l} = \mu_0 I_{inc} \tag{7}$$

$$\boldsymbol{B}_+ - \boldsymbol{B}_- = \mu_0 \boldsymbol{J} \times \hat{\boldsymbol{n}} \tag{8}$$

$$\boldsymbol{m} = I \int_S d\boldsymbol{a} \tag{9}$$

Electromagnetismo em meios materiais

$$\boldsymbol{\nabla} \cdot \boldsymbol{D} = \rho \tag{10}$$

$$\boldsymbol{\nabla} \cdot \boldsymbol{B} = 0 \tag{11}$$

$$\boldsymbol{\nabla} \times \boldsymbol{E} = -\frac{\partial}{\partial t} \boldsymbol{B} \tag{12}$$

$$\boldsymbol{\nabla} \times \boldsymbol{H} = \frac{\partial \boldsymbol{D}}{\partial t} + \boldsymbol{j} \tag{13}$$

$$\boldsymbol{D} = \varepsilon_0 \boldsymbol{E} + \boldsymbol{P} \tag{14}$$

$$\boldsymbol{H} = \frac{1}{\mu_0} \boldsymbol{B} - \boldsymbol{M} \tag{15}$$

$$\varepsilon = \varepsilon_0 (1 + \chi) \tag{16}$$

$$\mu = \mu_0 (1 + \chi_m) \tag{17}$$

Campos variáveis

$$\boldsymbol{S} = \frac{1}{\mu_0}(\boldsymbol{E} \times \boldsymbol{B}) \tag{18}$$

$$u = \frac{1}{2}\left(\epsilon_0 E^2 + \frac{1}{\mu_0} B^2\right) \tag{19}$$

$$\boldsymbol{\nabla} \cdot \boldsymbol{S} + \frac{\partial u}{\partial t} = 0 \tag{20}$$

$$\nabla^2 \boldsymbol{E} - \frac{1}{c^2}\frac{\partial^2 \boldsymbol{E}}{\partial t^2} = 0 \tag{21}$$

$$\nabla^2 \boldsymbol{B} - \frac{1}{c^2}\frac{\partial^2 \boldsymbol{B}}{\partial t^2} = 0 \tag{22}$$

Circuitos

$$\boldsymbol{j} = \sigma_c \boldsymbol{E} \tag{23}$$

$$I = \int_S \boldsymbol{j} \cdot d\boldsymbol{a} \tag{24}$$

$$V = RI \tag{25}$$

$$P = RI^2 = VI \tag{26}$$

$$R_{total} = \sum_i^N R_i \tag{27}$$

$$\frac{1}{R_{eq}} = \sum_i^N \frac{1}{R_i} \tag{28}$$

$$\sum I_i = 0 \tag{29}$$

$$\sum V_i = 0 \tag{30}$$

$$V = \frac{q}{C} \tag{31}$$

$$I = C\frac{dV}{dt} \tag{32}$$