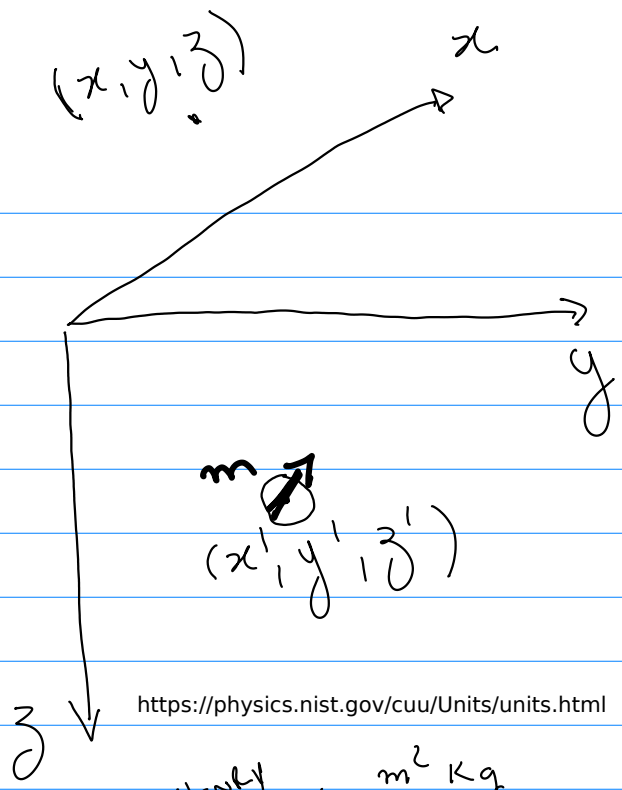
Dipolo



$B(x,y,z)$?

condições magnetostáticas
(ausência de corrente elétrica)

https://physics.nist.gov/cuu/Units/units.html

potencial magnético escalar

$$V(x,y,z) = -C_m \nabla \frac{1}{r}^T \mathbf{m}$$

HENRY $H = \frac{m^2\,Kg}{s^2\,A^2}$ TESLA (T)

$$\left[10^9 \frac{H\,A}{m}\right] = \left[10^9 \frac{m\,Kg}{s^2\,A}\right] = \left[10^9\,Tm\right]$$

$$\mathbf{r} = \begin{bmatrix} x-x' \\ y-y' \\ z-z' \end{bmatrix} \quad r = \left[(x-x')^2 + (y-y')^2 + (z-z')^2\right]^{1/2}$$

$$\nabla \frac{1}{r} = \begin{bmatrix} \partial_x \frac{1}{r} \\ \partial_y \frac{1}{r} \\ \partial_z \frac{1}{r} \end{bmatrix}$$

$\left[\frac{1}{m^2}\right]$

$$\mathbf{m} = m\,\hat{\mathbf{m}}$$

$$\hat{\mathbf{m}} = \begin{bmatrix} \cos I' \cos D' \\ \cos I' \sin D' \\ \sin I' \end{bmatrix}$$

$C_m = 10^9 \frac{\mu_0}{4\pi} \frac{H}{m}$

m = volume x intensidade de magnetização total

$[m^3]$ $[A/m]$

$$\nabla \frac{1}{r} = \frac{1}{r^3} \mathbf{r}$$

indução magnética

$$\mathbf{B}(x,y,z) = -\nabla V(x,y,z) = -\begin{bmatrix} \partial_x V \\ \partial_y V \\ \partial_z V \end{bmatrix}$$

$$\partial_x V = -\partial_x \left[-cm \left(\partial_x \frac{1}{r} m_x + \partial_y \frac{1}{r} m_y + \partial_z \frac{1}{r} m_z \right) \right]$$