

B_T - campo magnético da Terra

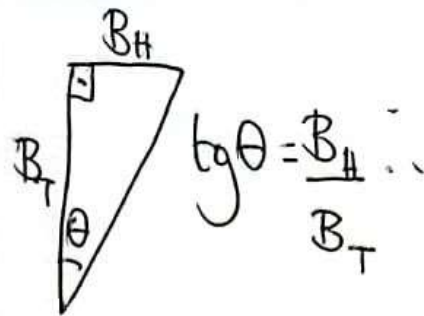
B_H - campo magnético gerado pelas Bobinas de Helmholtz

B - campo magnético resultante (direção da bússola)

$$B(z) = \frac{\mu_0 Ni}{2} \frac{R^2}{(R^2 + z^2)^{3/2}}$$

Para uma Bobina de Helmholtz, em $z = \frac{R}{2}$ (centro da bobina), temos

$$B_H = B\left(\frac{R}{2}\right) = \frac{8}{5\sqrt{5}} \frac{\mu_0 Ni}{R} \quad (1)$$

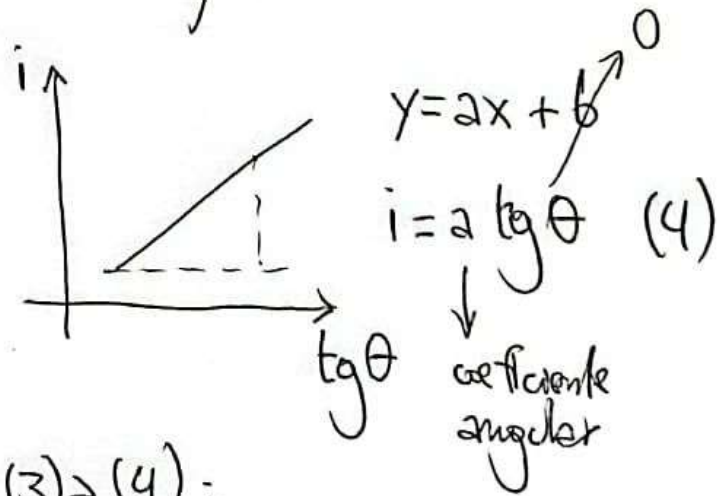


$$\therefore B_H = B_T \operatorname{tg} \theta \quad (2)$$

(1) \rightarrow (2):

$$\frac{8}{5\sqrt{5}} \frac{\mu_0 Ni}{R} = B_T \operatorname{tg} \theta \quad \therefore$$

$$\therefore i = \frac{5\sqrt{5} R B_T}{8\mu_0 N} \operatorname{tg} \theta \quad (3)$$



(3) \rightarrow (4):

$$a = \frac{5\sqrt{5} R B_T}{8\mu_0 N} \quad \therefore$$

$$\therefore B_T = \frac{8\mu_0 N a}{5\sqrt{5} R}$$