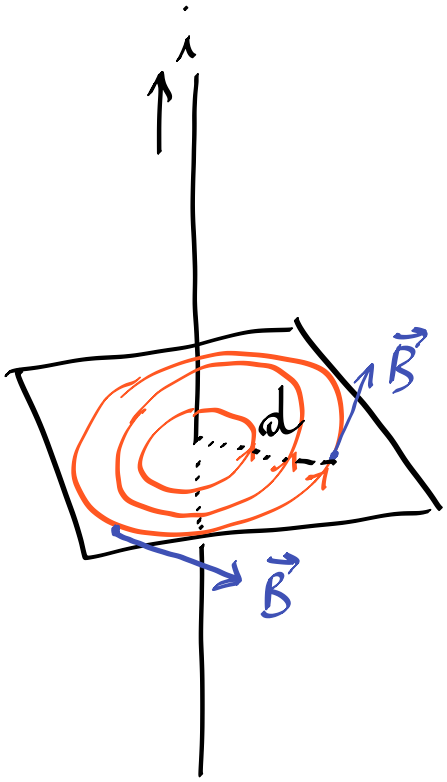
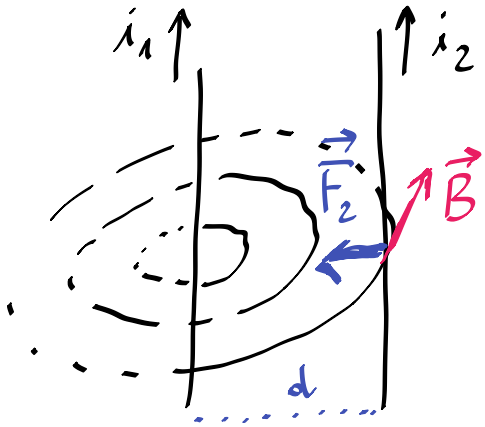
LEGGE DI BIOT-SAVART 1820



$$B = \frac{\mu_0}{2\pi}\frac{i}{d}$$

DIMOSTRAZIONE



X LA LEGGE DI AMPÈRE

$$F_2 = \frac{\mu_0}{2\pi}\frac{i_1 i_2}{d}\ell$$

$$F_2 = B i_2 \ell$$

B CAMPO MAGNETICO GENERATO DA i_1

$$\frac{\mu_0}{2\pi}\frac{i_1 i_2}{d}\ell = B i_2 \ell$$

$$B = \frac{\mu_0}{2\pi}\frac{i_1}{d}$$ C.V.D.

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$i = 180\ A$

$B = 5{,}0 \times 10^{-5}\ T$

$$B = \frac{\mu_0}{2\pi}\frac{i}{d}$$

$$\Downarrow$$

$$d = \frac{\mu_0}{2\pi}\frac{i}{B}$$

Imponiamo $B < 5{,}0 \times 10^{-5}\ T$

$$\frac{\mu_0}{2\pi}\frac{i}{d} < 5{,}0 \times 10^{-5}\ T \Rightarrow d > \frac{\mu_0}{2\pi}\frac{i}{5{,}0 \times 10^{-5}\ T} =$$

$$= 2 \times 10^{-7}\ \frac{N}{A^2}\ \frac{180\ A}{5{,}0 \times 10^{-5}\ T} =$$

$$= 0{,}72\ m$$

$$d > 0{,}72\ m$$

$$B = \frac{F}{il}$$

$$1\ T = 1\ \frac{N}{A \cdot m}$$

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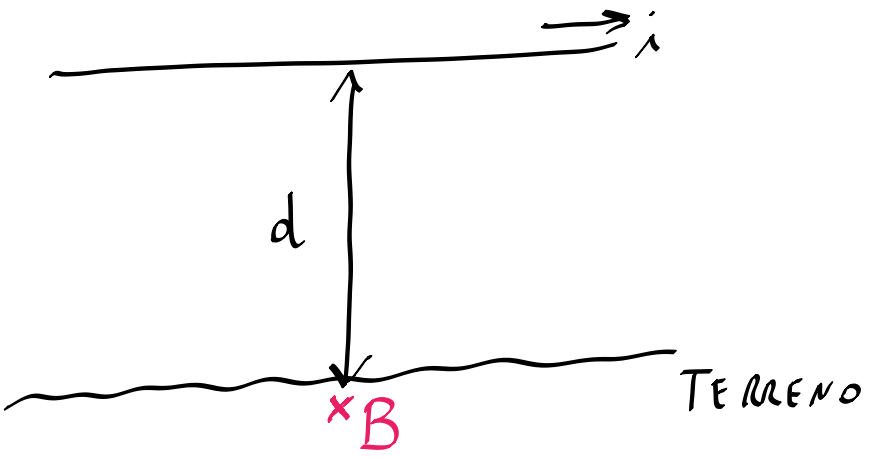
$\Delta V = 3{,}0 \times 10^5\ V \qquad P = 280\ MW$

$P = R i^2$

$R = \frac{\Delta V}{i}$

$P = \Delta V \cdot i$

$i = \frac{P}{\Delta V}$



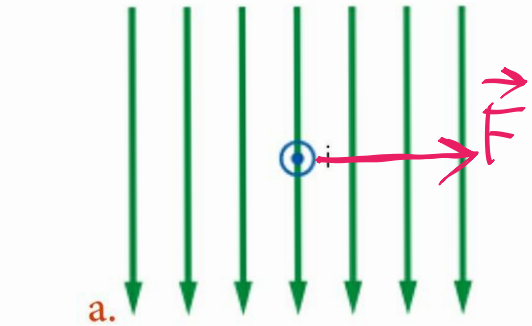
$$B = \frac{\mu_0}{2\pi}\frac{i}{d} \Rightarrow d = \frac{\mu_0}{2\pi}\frac{i}{B} = \frac{\mu_0 P}{2\pi \cdot \Delta V \cdot B} =$$

$$= \left(2 \times 10^{-7}\ \frac{N}{A^2}\right) \frac{280 \times 10^6\ W}{(3{,}0 \times 10^5\ V)(5{,}0 \times 10^{-5}\ T)} =$$

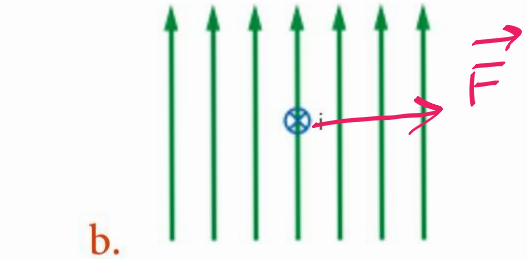
$$\simeq \boxed{3{,}7\ m}$$

3 Il segno ⊙ indica una corrente o un campo magnetico che esce dal foglio, mentre il simbolo ⊗ rappresenta una corrente o un campo magnetico che entra.

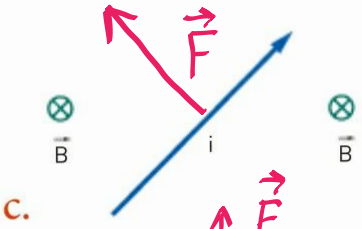
a.



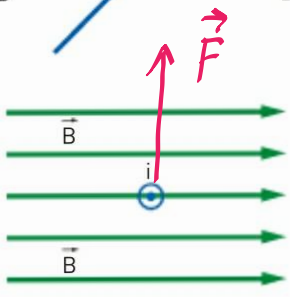
b.



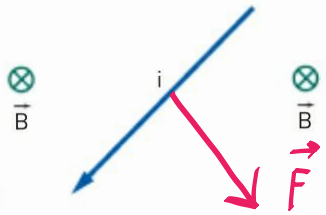
c.



d.



e.



▸ Disegna la direzione e il verso della forza magnetica che agisce in ciascuno dei seguenti fili percorsi da corrente immersi in un campo magnetico.