

Answer on Question #81132, Physics / Electromagnetism

Question:

A rectangular coil of 70 cm length, 10 cm width consists of 9 turns and carries 0.1 amperes current is hanged to a scale pan where its length is in a vertical position and lower part is perpendicular to a uniform magnetic field so balance is obtained. When the current is reversed it's needed to add 8.78 grams to the other side to restore balance again find the magnetic flux density given that $g = 10 \text{ m/s}^2$

Solution:

The Ampere's force difference equals to $\Delta f = 2BInl = mg$, therefore the magnetic flux density

$$\text{(magnetic induction) } B = \frac{mg}{2Inl} = \frac{0.0878}{2 \cdot 0.1 \cdot 9 \cdot 0.1} = 0.49 \text{ (T)}.$$

The answer:

The magnetic flux density (magnetic induction) $B = \frac{mg}{2Inl} = \frac{0.0878}{2 \cdot 0.1 \cdot 9 \cdot 0.1} = 0.49 \text{ Tesla..}$

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