Maxwell's Fallacy

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Abstract

Maxwell assumed that a time-varying electric field produces a magnetic field and devised his electromagnetic theory. In this paper the inconsistency in the Maxwell's electromagnetic theory has been presented.

Keyword : Maxwell's electromagnetic theory.

1   DERIVATION

By Maxwell's electromagnetic theory for a medium 1

$$\frac{E_1}{B_1} = c_1 = \frac{1}{\sqrt{\mu_1 \varepsilon_1}}$$

Now consider a medium 2 such that

$$\mu_2 = 2\mu_1$$

and

$$\varepsilon_2 = \varepsilon_1$$

then for the medium 2

$$\frac{E_2}{B_2} = c_2 = \frac{1}{\sqrt{\mu_2 \varepsilon_2}}$$

LHS :

$$\frac{E_2}{B_2} = \frac{E_1}{2B_1} \qquad \left[\begin{array}{l} \because \ \varepsilon_2 = \varepsilon_1 \Rightarrow E_2 = E_1 \\ \because \ \mu_2 = 2\mu_1 \Rightarrow B_2 = 2B_1 \end{array} \right]$$

$$\Rightarrow \ c_2 = \frac{c_1}{2} \qquad\qquad (i)$$

RHS :

$$\frac{1}{\sqrt{\mu_2 \varepsilon_2}} = \frac{1}{\sqrt{2\mu_1 \varepsilon_1}}$$

$$\Rightarrow \ c_2 = \frac{c_1}{\sqrt{2}} \qquad\qquad (ii)$$

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2   CONCLUSION

From (i) and (ii) , we can infer that

$$\frac{E}{B} = \frac{1}{\sqrt{\mu\varepsilon}}$$

is a wrong equation and consequently the Maxwell's electromagnetic theory is also wrong as it leads to such an equation.

References

1. Hugh D. Young, Roger A. Freedman, Albert Lewis Ford, *"Sears' and Zemansky's University Physics with Modern Physics 13th edition."*