Mass Displacement Field : R-Field

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Abstract
In this paper a new field theory for a moving mass has been presented.
Keywords : Field theory, Moving mass.

1 INTRODUCTION
A moving charge produces a magnetic field. In an analogous manner, it can be assumed that a moving mass will produce a field which can be termed as mass displacement field or R-field.

2 ETHER : A MEDIUM FOR R-FIELD
Let’s assume that there exists a medium termed as ‘ether’ which is responsible for R-field.

3 LAW OF R-FIELD
R-field \( \mathbf{R} \) in a medium due to a moving mass \( m \), at a distance \( r \) from the mass will be
\[
\mathbf{R} = \frac{\gamma m \mathbf{v} \times \mathbf{r}}{4 \pi r^3}
\]
where \( \mathbf{v} \) is the relative velocity of mass \( m \) with respect to the ether.

4 LAW OF R-FORCE
R-force \( \mathbf{F} \) experienced by a moving mass \( m \) in a R-field \( \mathbf{R} \) will be
\[
\mathbf{F} = m ( \mathbf{v} \times \mathbf{R} )
\]
where \( \mathbf{v} \) is the relative velocity of mass \( m \) with respect to the source of R-field.

5 MASS CURRENT
Let’s define a mass current as
\[
I_m = \frac{dm}{dt}
\]

6 BIOT-SAVART LAW FOR R-FIELD
It can be obtained from the law of R-field that the infinitesimal R-field \( d\mathbf{R} \) due to an infinitesimal mass current element \( I_m dl \), at a distance \( r \) from it will be
\[
d\mathbf{R} = \frac{\gamma I_m dl \times \mathbf{r}}{4 \pi r^3}
\]

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References