

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 may 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

$$\mathbf{R} = \frac{\gamma m \mathbf{v} \times \mathbf{r}}{4\pi r^3} \quad [\gamma \text{ is a medium-dependent constant }]$$

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 R-FIELD EQUATION DUE TO A FLOW OF MASS IN A CONDUIT

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 $I_m d\mathbf{l}$, at a distance r from it will be

$$d\mathbf{R} = \frac{\gamma I_m d\mathbf{l} \times \mathbf{r}}{4\pi r^3} + \frac{\gamma \lambda dl \mathbf{v}_{ce} \times \mathbf{r}}{4\pi r^3}$$

where

$I_m = \lambda v_{mc}$ = Mass flow rate in the conduit

λ = Linear mass density

v_{mc} = Speed of the mass flow with respect to the conduit frame of reference

v_{ce} = Velocity of the conduit with respect to the ether frame of reference

7 EFFECTS OF R-FIELD ON CELESTIAL MECHANICS

- Due to rotation of the sun about its own axis, a R-field will be generated and it may cause the orbit of the planet to precess (i.e., apsidal precession and nodal precession of the planet's orbit).
- The rotation of a planet about its own axis in the R-field of the sun may cause the axis of rotation of the planet to precess (i.e., axial precession of the planet).
- Due to rotation of a planet about its own axis, a R-field will be generated and it may cause the orbit of the satellite to precess (i.e., apsidal precession and nodal precession of the satellite's orbit).
- The rotation of a satellite about its own axis in the R-field of its planet may cause the axis of rotation of the satellite to precess (i.e., axial precession of the satellite).

References

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