Space-time Torsion as a Manifestation of Magnetism, and the Constancy of the Speed of Light

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Abstract

To show that the speed of light is constant in all reference frames, we need to, First, accept that space-time is granular and, second to entertain the postulate that a mass moving through spacetime affects the space-time. That torsion could be identified with magnetism was suggested by Kaare Borchenius. We will be following his suggestion.

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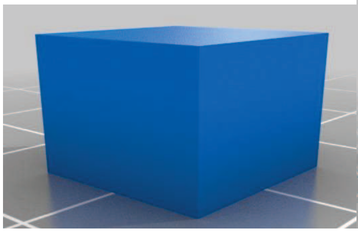
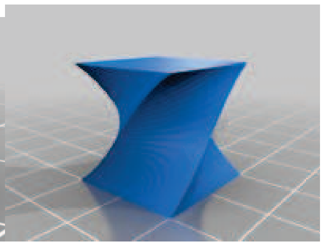
I. INTRODUCTION

That torsion could be identified with magnetism was suggested by Kaare Borchenius. We will be following his suggestion.

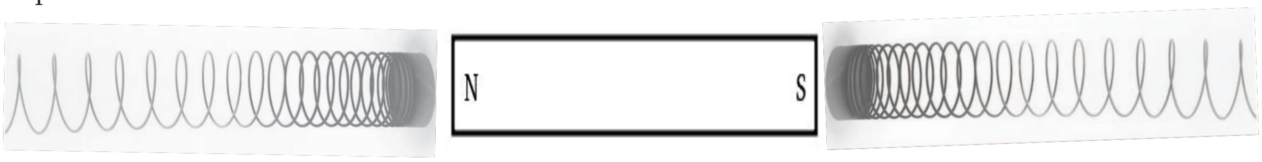
As a example of General Relativity using curvature, consider the Schwarzschild metric: solution:$-c^2 d\tau^2 = -(1 - \frac{r_s}{r})c^2 dt^2 + (1 - \frac{r_s}{r})^{-1} dr^2 + r^2 d\Omega^2$.

Our granular space-time considers the grains to be Planck scale 4-dimensional cubes.

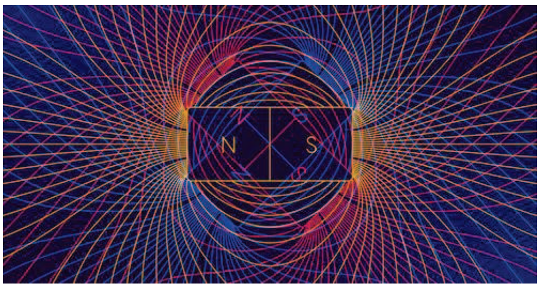
The flattened cube on the left represents the cube shortened in the direction of motion and lengthened in the direction of time. The twisted cube on the right (torsion) represents our model of magnetism.

Torsion can be either left handed or right handed. We suggest one of them corresponds to a north pole of a magnet whilst the other corresponds to the south pole. A simplistic example is illustrated as follows:

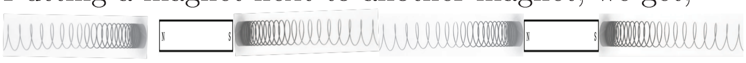


If however, we look at more than one field line, e.g,



we get a more complex picture.

Putting a magnet next to another magnet, we get,



In this case, the magnets (N to S) pull together.

Reversing one of the magnets (S to S or N to N), the magnets are pushed apart. The push force decreases as the magnets increase their distance apart. As the distance increases, the torsion decreases (as evidenced by the spiral connecting them unwinding).

Unwinding at large distances can go only to zero because a magnet has two poles and at large distances the magnetism cancels. This might suggest the absence of magnetic monopoles.

Consider now, the Kerr-Newman solution. It describes a rotating charged mass.

$c^2 d\tau^2 = -(\frac{dr^2}{\Delta} + d\theta^2)\rho^2 + (cdt - \alpha sin^2\theta d\phi)^2 \frac{\Delta}{\rho^2} - ((r^2 + a^2)d\phi - acdt)^2 \frac{sin^2\theta}{\rho^2}$

$a = \frac{J}{Mc}$

$\rho^2 = r^2 + a^2 cos^2\theta$

$\Delta = r^2 - r_s r + a^2 + r_Q^2$

$r_s = \frac{2GM}{c^2}$

$r_Q^2 = \frac{Q^2 G}{4\pi\epsilon_0 c^4}$

The axis of rotation is coincident with the magnetic axis. We see then that as one moves away from the mass (along the axes) the magnetic field diminishes while the torsion decreases. This is a large-scale expression of our torsion/magnetism model.

Note that Maxwell's Equations are consistent with our model (particularly the indicated forth equation.

Maxwell's Equations

$\nabla \bullet D = \rho_v$

$\nabla \bullet B = 0$

$\nabla \times E = -\frac{\partial \boldsymbol{B}}{\partial t}$

—> $\nabla \times H = \frac{\partial D}{\partial t} + J$

II. CONSTANCY OF THE SPEED OF LIGHT

Note first that a venue (the basic unit of space-time 4-volume is the minimum possible 4-volume. All venues then, have the same 4-volume (but their x,y,z, and t components can vary).

To show that the speed of light is constant in all reference frames, we need to, first, accept that space-time is granular and, second to entertain the postulate that a mass moving through spacetime effects the space-time. And also we do not accept the idea that the Planck length length is the smallest possible length, for that would seem to violate Special Relativity. Instead we think that the Planck volume (Planck length $\times$Planck length $\times$ Planck length $\times$Planck time) is the smallest possible 4-volume.

That being said, consider a photon emitted from a source at 'A', and a detector at 'B' in the path of the photon. If the detector at 'B' moved toward 'A', one might logically expect that the measured speed of the photon would be larger than c. The following is a possible mechanism why this might not be so: We assume that space-time is indeed granular at The Planck scale and also assume that an object moves through space-time influences the space-time. Now if a photon moves from a source to a detector, it pushes the granules toward the detector. This results in there being an increase in the number of granules between the photon and the detector. And at the same time this results in the granule time element increasing (as the spacial dimension in the direction of motion decreases. Note that the 4-volume is constant). These phenomena reduce the speed of the photon to c.

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[5] https://Maxwells-equations.com