A Classical Derivation of Relativity

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ABSTRACT

Since the energy of charges is in their fields, it is assumed that the forces between a moving charge and a detector charge it is approaching are developed as elementary forces at every point in both charge fields. These elementary forces propagate outwards from their points of origin at the speed of light relative to their charge centers. The detector doesn't observe the moving charge directly; it observes a surrogate of the moving charge formed by a set of these elementary forces. The surrogate grows faster than the charge moves, thereby explaining the increase in the charge's momentum over its Newtonian value; the charge's mass doesn't change. The fast moving charge's time doesn't slow down – it just seems to slow down because the detector senses the surrogate as it was at an earlier time. The geometry of the surrogate is described by the equations of relativity.

INTRODUCTION

This paper presents a classical derivation of relativity. It assumes that the forces on charges are developed in the charge fields, where the energy is, as contrasted to the conventional assumption that the forces are developed on tiny entities at the charge centers.

DERIVATION

It is assumed that the interaction between two charges takes place at every point in their overlapping fields and that the resulting elementary forces propagate outward in both fields at the velocity of light relative to their charge centers. The effect of the motion of a moving charge on the detector it is approaching is examined.

Fig. 1 shows a charge q at a time t; it is moving towards a detector D with velocity **v**. The figure also shows the **central field plane** transverse to the charges' motion that shows where the charge is along its path.

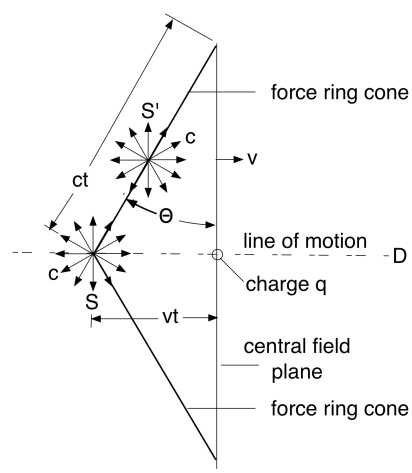
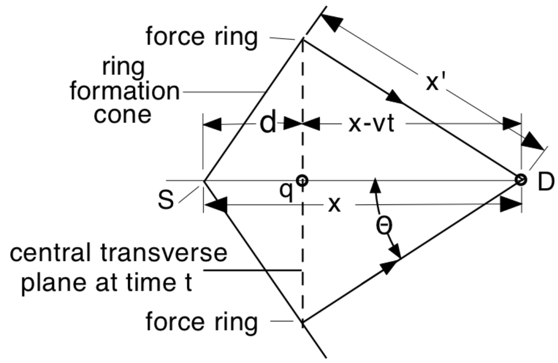


Fig.1 Generation of Force-Ring Cone

The radial rays S were formed in the detector's field at an earlier time by the charge center when it passed S. The rays transmitted the elementary force resulting from the interaction at this point to other points in the detector's field; corresponding rays were formed in the moving charge's field**.**

q moves along the axis of the **force-ring cone** whose apex is at S and whose surface makes an angle $\theta=\arcsin\beta$ with the central field plane, where $\beta=v/c$. When the central field plane passed points on the cone, such as S', it excited more force rays, some reinforcing the rays from S that follow the cone. The force ring, growing in strength in D's field as q moved towards D, is associated with q at the time it passed S

Fig. 2 shows the generation of the relativity equations. The source S of the ring formation cone, is a distance x from D. The continuum of force ring cones, formed as the charge moved toward D, approach D along the cone orthogonal to them; the force rings on this cone serve as a surrogate for the moving charge as seen by the detector.



At time t, the charge was a distance x-vt from D, but D sensed it as if it was at a distance x'=(x-vt)/cosθ from D. Therefore

$$x' = \frac{x - vt}{\sqrt{1-\beta^2}} \qquad (1)$$

The charge is seen as at it was at the origin of the interaction ring cone. The time it was there was t"=t-d/v where d=[xcosθ]tanθ **so**

$$t'' = t - \frac{xv}{c^2} \qquad \textbf{(2)}$$

This is time in the stationary system. Time in the moving charge system is t" divided by $\sqrt{1-\beta^2}$ to make the velocities the same in the two systems. This yields

$$t' = \frac{t - \frac{xv}{c^2}}{\sqrt{1-\beta^2}} \qquad (3)$$

Equations (1) and (3) are the equations of relativity.

CONCLUSION

It has been shown that the assumption that the interactions between charges take place in their fields provides the basis for a classical derivation of relativity. While (1) and (3) look like the Lorentz transform they shouldn't be called that since the path taken by the elementary forces can't be described by Maxwell's equations.

The derivation suggests that we observe charges via surrogates formed in the observer's field. The apparent "long lifetimes" of unstable charges occurs because the surrogate of a vanished charge that is moving near the speed of light comes close enough to the center of the detector charge to have a large affect.

The surrogates grow with a speed $v_s = v / \sqrt{1-\beta^2}$, thus accounting for the apparent increase in the momentum of a charge as its speed increases; the masses of charges don't increase with their speed—they just seem to increase.