The Relativistic Space-Time Perspective

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13 November 2013

Key words: Perspective, Physical Values, Relativistic Distortion, distorted Velocity, parallel relativistic equations, Time, Mass, Length, equation confirmation table

Table of Contents

1.0 Introduction/Abstract

This paper formulates additional relativistic equations that examine the deductions of Dr. Einstein from a relativistically distorted perspective. The equations are derived from a theoretic ideal "non-Relativistic" velocity that can be distorted in the same manner as the length, time, and mass into an apparent "Relativistic" velocity. The equations that are formulated here examine the true/real (or the no Special Relativistic Perspective Distortion, abbreviated noSRPD) velocity of an object and use it to determine the distorted (Special Relativistic Perspective Distortion, or SRPD) velocity for the same object. This study also derives opposite equations that calculate the noSRPD velocity [$\text{Velocity}_{\text{noSRPD}}$] from the SRPD velocity [$\text{Velocity}_{\text{SRPD}}$].

Current theoretical views are that a relativistically distorted traveller would not observe actions moving more slowly. On the contrary, everything other than the traveller's immediate environment would appear to be moving faster. The velocity of the object would not be part of the immediate environment; it would be how the object interacts with the outside environment. The decreased time for the distorted relativistic perspective means that the perspective equations have a different relationship: calculating a higher velocity from the perspective of the moving object.

Two of the equations developed in this paper show this relationship from different points of view. The independent variables have no relativistic deformation [$\text{Velocity}_{\text{noSRPD}}$], and the dependent variable is the value of the expected velocity to be observed because of the relativistic deformation [$\text{Velocity}_{\text{SRPD}}$]. The existence/non-existence of an ideal value for an absolute non-relativistic velocity value is not debated in this paper, as it is an indeterminate real ideal. However, this velocity is simply another one of the valid, theoretic ideals that classic relativity (indeed, all of physics) relies on. The fact that an absolute velocity may be unobservable is theoretically unimportant.

$$\text{Velocity}_{\text{SRPD}} = \text{Velocity}_{\text{noSRPD}}/(1 - \text{Velocity}_{\text{noSRPD}}^2/c^2)^{½}$$

Because less time will pass when there is a relativistic deformation, the velocity will appear distorted just as the length, time, and mass are. The inverse relationship would occur when the independent variable is the observed velocity from the relativistic or distorted view $\text{Velocity}_{\text{SRPD}}$,

and the dependent variable is the true/non-relativistic/non-distorted velocity $\text{Velocity}_{\text{noSRPD}}$. The parallel equation for the relativistic perspective is as follows:

$$\text{Velocity}_{\text{noSRPD}} = \text{Velocity}_{\text{SRPD}} /(1 + \text{Velocity}_{\text{SRPD}}{}^{2}/c^{2})^{½}$$

This relationship allows for the additional development of eight formulae/equations for the velocity, mass, time, and linear deformation.

There is tabular confirmation for the validity of the above equations; the relativistic perspective equations have been confirmed to be correct and consistent with the Classic equations to 2000 significant digits for 37 velocity values ranging from 1.0E-500m/s to (c – (1.0E-500))m/s. That table is immediately available upon request. All of the other equations have been confirmed as well.

2.0 Relativistically Distorted vs. Non-Relativistically Distorted Velocities

Special Relativistic Perspective Distortion (SRPD) determines the relationship between the real value for any variable and the value for that variable when distorted - from the perspective of the moving object.

This relationship is derived from the time equation. In classic Special Relativity, 'Real' labels are based on approximations. Because all the observable objects in the universe are in motion, determining an exact velocity or a zero velocity from the observed velocity is impossible; thus, the exact relativistic effect is indeterminable. The rest/real labels are theoretical concepts, not confirmable data. However, the relationship between the relativistic and non-relativistic values is deducible. In the classic time distortion equation:

c – the speed of light [299,792,458 m/s; this theory does not require any particular boson velocity. The speed of light can also be classified as 'common knowledge']

Time – Real seconds that would pass for any defined event, i.e., the time it would take for EM radiation to travel a set distance for a non-moving body without any special relativistic distortion

Time' – Real seconds that would pass for the same event on a body under special relativistic distortion

$\text{Velocity}_{\text{Real}}$ – The observed velocity from a real-time/at-rest/no-apparent-special-relativistic-distortion viewpoint

$$\text{Time}' = \text{Time}/(1-\text{Velocity}_{\text{Real}}^2/c^2)^{½}$$

In the above equation, the Time seconds denote the number of real seconds that would pass for an action in which neither the viewpoint nor the observed object were distorted. The Time' seconds denote the greater number of real seconds observed to have taken place for a known action on a relativistically distorted object. The relativistic distortion causes the pace of time to slow down for some defined events, though not for all. If the object were moving from an outside perspective, the exchange of gluons and the velocity of their propagation would slow down, but the actual velocity of the object would not change. From the perspective of the moving object, this exchange would not slow the motion down. However, because all boson velocities would be slowed from an outside perspective, events within the distorted object would also move more slowly. Again, a point that some will see as overstated: the ENTIRE theory of Special Relativity relies on an ideal: the speed of light, that speed being defined. The actual value of the definition is not logically important; it merely applies a specific value to the "c" constant in the equations. Simply placing a constant in an equation means that the values for variables that share the measurement units have to be able to have a zero quality. If not, then the proportions of that equation will not be valid. There would be configurations for any equation that would lead to (if any denominator expression can approach zero) for an infinite value to the solution. We live in an environment where one of the dictates are Planck constants – a declaration that while they are mathematically, logically definable, it is impossible to assign anything to any value. Even to the point that there <u>cannot</u> be an infinite amount of mass, linear dimensions variations in our reality. Logically, for any mathematic expression with variables to be a valid mathematic expression, the variable must be able to range between zero and infinity. So the final point is that logical reasoning cannot be the absolute determinate of any real quantity in our reality. But logically infinity and zero can be a valid value for any variable.

An alternative would be to relate the number of seconds/time units that will pass on the distorted object. This distortion is a very fundamental part of our reality, but it is not simple or absolute. Newton's Laws of Motion do not allow for relativistic effects, but this limitation does not invalidate them. In the original Special Relativity, the equations do not allow for <u>General</u> relativistic effects. However, assuming any numerically defined speed means you are also assuming the existence of a zero velocity, and this 'Real' velocity is defined with respect to an immobile point – a simple theoretic ideal. So we will define two more new variables, which will recognise the relativistic second as the inverses of a real second. Again, if the distortion factor is two, then whenever 2 real seconds pass, 1 relativistic second will pass. Fewer relativistic seconds pass for any given number of real/non-relativistic seconds. A definition of the inverse equation would use the <u>S</u>pecial <u>R</u>elativistic <u>P</u>erspective's <u>D</u>istortions, i.e., the <u>SRPD</u> Time perspective, and the independent velocity variable would use the non-relativistically distorted time values. It also should be noted that it is legitimate to have both relativistic (distorted) and non-relativistic (undistorted) values in any equation provided they are the same on both sides (i.e., if <u>only</u> relativistic seconds and <u>only</u> real metres are measured).

$\text{Time}_{\text{noSRPD}}$ - relativistic seconds passing from an SRPD viewpoint when that viewpoint is moving at a velocity of zero under and under no other distortion – i.e. the parallel to the Time variable in the classic relativity equations.
$\text{Time}_{\text{SRPD}}$ - relativistic seconds passing for an SRPD viewpoint dependant on a variant degree of distortion. In the case of the equation below, the SRPD variables only have relativistic seconds in their definition.
$\text{Velocity}_{\text{noSRPD}}$- the velocity measured from a SRPD viewpoint under no distortion

The value of $\text{Velocity}_{\text{noSRPD}}$ would be parallel to the value of $\text{Velocity}_{\text{Real}}$, which is the velocity perceived from a relativistic viewpoint under no distortion. $\text{Time}_{\text{noSRPD}}$ and $\text{Time}_{\text{SRPD}}$ are inverses of classic time values, so the equation would be the inverse of the Classic equation:

$$\text{Time}_{\text{SRPD}} = \quad \text{Time}_{\text{noSRPD}}*(1- \text{Velocity}_{\text{noSRPD}}{}^2/c^2)^{½}$$

The velocity is inversely related to the passage of time, and hence, dividing both sides by 1 <u>real/noSRPD</u> metre allows a change. So then equation could determine the relativistic/non-relativistic velocity instead of the time distortion.

$$\text{Time}_{\text{SRPD}} = \text{Time}_{\text{noSRPD}}*(1- \text{Velocity}_{\text{noSRPD}}{}^2/c^2)^{½}$$
$$\text{Time}_{\text{SRPD}}/(1\text{m}_{\text{noSRPD}}) = (\text{Time}_{\text{noSRPD}}/(1\text{m}_{\text{noSRPD}}) * (1\text{-Velocity}_{\text{noSRPD}}{}^2/c^2)^{½}$$

Inverting the equation:

$$1\text{m}_{\text{noSRPD}}/\text{Time}_{\text{SRPD}} \quad = (1\text{m}_{\text{noSRPD}}/\text{Time}_{\text{noSRPD}}) \,/\, (1\text{-Velocity}_{\text{noSRPD}}{}^2/c^2)^{½}$$

Set the <u>variable</u> $\text{Time}_{\text{noSRPD}}$ to the following value:

$$\text{Time}_{\text{noSRPD}} = 1\text{m}_{\text{noSRPD}} /\text{Velocity}_{\text{noSRPD}}$$

Thus,

$$\text{Velocity}_{\text{noSRPD}} = 1\text{m}_{\text{noSRPD}} / \text{Time}_{\text{noSRPD}}$$

So another expression of the equation would be

$$1\text{m}/\text{Time}_{\text{SRPD}} = \text{Velocity}_{\text{noSRPD}} / (1-\text{Velocity}_{\text{noSRPD}}{}^{2}/c^{2})^{½}$$

It is then perfectly valid to define $\text{Velocity}_{\text{SRPD}}$ in a parallel fashion to the definition of $\text{Velocity}_{\text{noSRPD}}$:

$\text{Velocity}_{\text{SRPD}}$ – velocity calculated with the division of a single noSRPD metre divided by the SRPD time value. This velocity observed from the Relativistic Perspective would increase at the same rate at which time slows

Thus, we have Equation 1, which is the founding principle of the relativistic perspective:

$$\text{Velocity}_{\text{SRPD}} = \text{Velocity}_{\text{noSRPD}} / (1\text{-Velocity}_{\text{noSRPD}}{}^2/c^2)^{½} \qquad \text{Equation 1}$$

Everything in the universe has a velocity. Nevertheless, defining a point at rest is impossible, particularly when general relativistic distortions are also considered. When we determine the speed of light, we do so from a viewpoint that is assumed to have Planck level/zero relativistic distortion. Presuming an ideal is a perfectly logical and valid scientific strategy.

So let us examine all the relativistic distortion not from a real viewpoint, but from a theoretical viewpoint under no/zero special relativistic distortion (noSRPD). A zero velocity for an object may be completely indeterminate, but that does not mean it is mathematically indefinable. ‘F=ma’ is an idealised proposition, as all the forces acting upon a body cannot be determined perfectly. However, these forces can be estimated with some inaccuracy. Even more crucially, when Newton wrote the ‘F=ma’ law, he presumed (for simplicity’s sake) that there was a single acceleration vector. Two equal forces could be moving against a single object with vectors that oppose each other exactly, and the body would not accelerate. In this case, it is not true that there is no force acting on the object. The equation ‘$F=GMm/r^2$’ faces the same limitations: there are always many more than two bodies of mass that are exerting forces above Planck levels with different energy levels and vectors. However, both equations are useful for making predictions of real actions and estimating all the forces that are acting on a body. Again, we are presuming zero velocity/zero relativistic effects for the definition of noSRPD variables.

The SRPD equations are derived from the time equation, using an Absolute (or “Real”) velocity. It would be a velocity with no Relativistic distortion. That is the presumption for all of classic Special Relativity: real values are values observed from a theoretic zero velocity. All the observable objects in the universe are in motion, and the maximum real velocity in our reality is c (light speed, or 299,792,458 m/s). This velocity can also be defined by velocity that would be brought about by moving 1 Planck length in a single Planck time constant:

Maximum Velocity = Planck Length / Planck Time
Maximum Velocity = $(\hbar G/c^3)^{\frac{1}{2}} / (\hbar G/c^5)^{\frac{1}{2}}$
Maximum Velocity^2 = $(\cancel{\hbar G/}c^3) / (\cancel{\hbar G/}c^5)$
Maximum Velocity^2 = $(1/c^3) / (1/c^5)$
Maximum Velocity^2 = c^2
Maximum Velocity = c

So if the Planck constants are one of the determinants of the maximum velocity, it is surely reasonable to postulate that the minimum velocity would be the inverse:

Planck Velocity = 1/c = 3.3355338153E-9

Although an imaginary Planck accurate timing device produces no measurable movement, its movement could be calculated by a three-dimensional rotation in which a survey is done of observable objects. Those objects that were perpendicular to the motion of the moving point would display a linear distortion. The observing device [O.D.] would then exert a thrust parallel to that distortion. If that thrust meant an increase in the velocity, the O.D. would measure an increased linear distortion, with the opposite happening if it meant a decrease in the velocity. A very careful measurement of all visible objects for any change in their distortion – eventually a point would be reached where any movement in any direction would increase the distortion.

The described experiment would be impossible methodologically, but it is still a valid ideal. The measurement of velocity from that point would provide a ‘real’ velocity that is not relativistically distorted. Though the O.D. would only be at a zero velocity point at the moment it was marked. The movement of objects around the viewpoint would change the General relativistic distortions, twisting the shape of space-time around it. Leaving a robotic device to mark the zero-velocity point would be pointless because it would not remain at zero velocity. It would be a very theoretical but a valid ideal zero velocity. Mr. Newton's '$F=GMm/r^2$' is another ideal: it presumes only two bodies with no intrusions and an exact measurement of the radius between the two objects. That condition does not exist anywhere in reality. Here on Earth, we have a very direct example of body distortions: the tides. We may not be able to feel the gravitational force distortion from the Moon or the Sun, but we see it in terms of weather effects and the tides.

Hence, with Equation 1:

$$\text{Velocity}_{\text{SRPD}} = \text{Velocity}_{\text{noSRPD}}/(1 - \text{Velocity}_{\text{noSRPD}}^2/c^2)^{½} \qquad \text{Equation 1}$$

We square both sides of the equation to determine its inverse form:

$$\text{Velocity}_{\text{SRPD}}^2 = \text{Velocity}_{\text{noSRPD}}^2/(1 - \text{Velocity}_{\text{noSRPD}}^2/c^2)$$

Them multiply both sides by the $(1 - \text{Velocity}_{\text{noSRPD}}^2/c^2)$ expression:

$$\text{Velocity}_{\text{SRPD}}^2 * (1 - \text{Velocity}_{\text{noSRPD}}^2/c^2) = \cancel{(1 - \text{Velocity}_{\text{noSRPD}}^2/c^2)} * (\text{Velocity}_{\text{noSRPD}}^2/\cancel{(1 - \text{Velocity}_{\text{noSRPD}}^2/c^2))}$$

Expand $\text{Velocity}_{\text{SRPD}}^2 * (1 - \text{Velocity}_{\text{noSRPD}}^2/c^2)$:

$$\text{Velocity}_{\text{SRPD}}^2 - \text{Velocity}_{\text{SRPD}}^2 * \text{Velocity}_{\text{noSRPD}}^2/c^2 = \text{Velocity}_{\text{noSRPD}}^2$$

Adding $(\text{Velocity}_{\text{SRPD}}^2 * \text{Velocity}_{\text{noSRPD}}^2/c^2)$ to both sides results in the following:

$$(\text{Velocity}_{\text{SRPD}}^2 - \cancel{\text{Velocity}_{\text{SRPD}}^2 * \text{Velocity}_{\text{noSRPD}}^2/c^2}) + (\cancel{\text{Velocity}_{\text{SRPD}}^2 * \text{Velocity}_{\text{noSRPD}}^2/c^2}) = \text{Velocity}_{\text{noSRPD}}^2 + \text{Velocity}_{\text{SRPD}}^2 * \text{Velocity}_{\text{noSRPD}}^2/c^2$$

The expression $\text{Velocity}_{noSRPD}^2 + \text{Velocity}_{SRPD}^2 * \text{Velocity}_{noSRPD}^2/c^2$ can then be simplified to

$$\text{Velocity}_{SRPD}^2 = \text{Velocity}_{noSRPD}^2 * (1+ \text{Velocity}_{SRPD}^2/c^2)$$

After dividing both sides by $(1+ \text{Velocity}_{SRPD}^2/c^2)$,

$$\text{Velocity}_{SRPD}^2 / (1+ \text{Velocity}_{SRPD}^2/c^2) =$$
$$(\text{Velocity}_{noSRPD}^2 \; * \cancel{(1+ \text{Velocity}_{SRPD}^2/c^2)})/ \cancel{(1+ \text{Velocity}_{SRPD}^2/c^2)}$$

Thus,

$$\text{Velocity}_{SRPD}^2 / (1+ \text{Velocity}_{SRPD}^2/c^2) = \text{Velocity}_{noSRPD}^2$$

Or

$$\text{Velocity}_{noSRPD}^2 = \text{Velocity}_{SRPD}^2/(1 + \text{Velocity}_{SRPD}^2/c^2)$$

Taking the square root of both sides results in

$$(\text{Velocity}_{noSRPD}^{\cancel{2}})^{\cancel{1/2}} = (\text{Velocity}_{SRPD}^{\cancel{2}})^{\cancel{1/2}} / (1 + \text{Velocity}_{SRPD}^2/c^2)^{1/2}$$

So

$$\text{Velocity}_{noSRPD} = \text{Velocity}_{SRPD} / (1 + \text{Velocity}_{SRPD}^2/c^2)^{1/2} \qquad \text{Equation 2}$$

The above was confirmed using the equation $\text{Time}' = \text{Time}/(1 - \text{Velocity}_{noSRPD}^2/c^2)^{1/2}$ to calculate the relativistic velocity by multiplying the noSRPD velocity by the proportion Time/Time'. The range of real [noSRPD] velocities was from 1.0E-500 m/s to c – (1.0E-500) m/s. Whereas the velocity is an observable distortion on a moving object, the apparent (SRPD) velocity is immediately observable. Equation 2 is the logical inverse to Equation 1: the Velocity_{SRPD} is the independent variable and Velocity_{noSRPD} is the dependent variable. While the validity of the observed relativistic velocity is uncertain, so is the real velocity used in the velocity equations.

Both velocity equations can also mean (for Equation 1):

$$\text{Velocity}_{\text{SRPD}} = \text{Velocity}_{\text{noSRPD}}/(1 - \text{Velocity}_{\text{noSRPD}}{}^{2}/c^{2})^{½} \qquad \text{Equation 1}$$

After dividing both sides by $\text{Velocity}_{\text{noSRPD}}$, we obtain

$$\text{Velocity}_{\text{SRPD}} / \text{Velocity}_{\text{noSRPD}} = (\cancel{\text{Velocity}_{\text{noSRPD}}}/(1 - \text{Velocity}_{\text{noSRPD}}{}^{2}/c^{2})^{½})/ \cancel{\text{Velocity}_{\text{noSRPD}}}$$

Consequently,

$$\text{Velocity}_{\text{SRPD}}/\text{Velocity}_{\text{noSRPD}} = 1/(1 - \text{Velocity}_{\text{noSRPD}}{}^{2}/c^{2})^{½}$$

Or

$$\text{Velocity}_{\text{noSRPD}}/\text{Velocity}_{\text{SRPD}} = (1 - \text{Velocity}_{\text{noSRPD}}{}^{2}/c^{2})^{½}$$

Also reasoning from Equation 2:

$$\text{Velocity}_{\text{noSRPD}} = \text{Velocity}_{\text{SRPD}} / (1 + \text{Velocity}_{\text{SRPD}}{}^{2}/c^{2}) \qquad \text{Equation 2}$$

We divide both sides by $\text{Velocity}_{\text{SRPD}}$

$$\text{Velocity}_{\text{noSRPD}} / \text{Velocity}_{\text{SRPD}} = ((\cancel{\text{Velocity}_{\text{SRPD}}}/(1 + \text{Velocity}_{\text{noSRPD}}{}^{2}/c^{2})^{½})/ \cancel{\text{Velocity}_{\text{SRPD}}}$$

As a result,

$$\text{Velocity}_{\text{noSRPD}}/\text{Velocity}_{\text{SRPD}} = 1/(1 + \text{Velocity}_{\text{SRPD}}{}^{2}/c^{2})^{½}$$

And

$$\text{Velocity}_{\text{SRPD}}/\text{Velocity}_{\text{noSRPD}}= (1 + \text{Velocity}_{\text{SRPD}}{}^{2}/c^{2})^{½}$$

The existence of these proportions means that the expressions $|(1 - \text{Velocity}_{\text{noSRPD}}{}^2/c^2)^{½}|$ and $|(1 + \text{Velocity}_{\text{SRPD}}{}^2/c^2)^{½}|$ can be interchanged by inverting the appropriate proportion.

Both gravitational and special relativistic distortion form part of the entire visible environment, i.e., they form part of reality. A zero velocity can be estimated, but by the definition of the time equations in special relativity, all velocities have a relativistic factor. Thus, the $\text{Velocity}_{\text{Real}}$ values used in any relativistic equation are **approximate**. Again, the terms should not be relativistic and real, but rather relativistic and non-relativistic, as any outside-observed velocity is as valid as a relativistic velocity. The sole issue is the precision of the value. For lower velocities, we employ 'noSRPD'; for higher velocities, the value of 'SRPD' would be better, which indicates the need for conversion to a non-relativistically distorted value to make the result more accurate. However, no measurement will ever be absolutely precise.

The above thought experiment presumes undistorted measurements. It is unimportant that such an ideal is currently seen as impossible. A theoretic ideal is a valid tool that is used throughout science and can be presumed. A valid zero velocity will likely always be an unreachable ideal, because impossibly precise observations that would be necessary to survey a sufficient number of objects to use their special relativistic distortion in relation to ours. Gravitational distortions complicate the situation further. Sufficient data may be a theoretically reachable goal, but gathering such data would require multiple observation points in distinct and separate (on an intra-galactic scale) locations. There is also the difficulty of moving a sophisticated observation device at a relativistic velocity for observations of distortions from the relativistic viewpoint. This velocity would distort different variables in different ways. The most obvious examples are the mass of the matter and the velocity of any boson particle. While the matter would increase in mass, all bosons would decrease in both velocity and mass. As a result, the relationship between the two quantities would become dysfunctional. All the elements would dissemble to their component protons, neutrons and electrons, and furthermore, the gluons would be weakened to a degree that approaches the infinitesimal. Because the repulsive force of the positive charge would weaken to the same degree, the mass of the nucleons that are bound together would increase accordingly. Thus, any passengers aboard a vessel that is moving at a relativistic velocity would find themselves both gaining weight and losing muscular force.

2.1 Additional Relativistic Equations

The Relativistic Perspective velocity formulae can be used to deduce the conditions for bodies at rest in terms of time, length, and mass. The relativistic and non-relativistic ratios are always the same, and the velocity distortion equation allows for the development of additional relativistic equations. The ratio of the distorted apparent SRPD velocity to the noSRPD velocity ($\mathrm{Velocity}_{SRPD}$/ $\mathrm{Velocity}_{noSRPD}$) is identical to the relativistic ratios: all use the $|(1-\mathrm{Velocity}_{noSRPD}{}^2/c^2)^{½}|$ expression.

The classic time distortion equation that we referred to earlier is

$$\mathrm{Time}' = \mathrm{Time}/(1 - \mathrm{Velocity}_{noSRPD}{}^2/c^2)^{½}$$

Again, this equation replaces $(1 - \mathrm{Velocity}_{noSRPD}{}^2/c^2)^{½}$

$$\mathrm{Time}' = \mathrm{Time}/(\mathrm{Velocity}_{SRPD}/\mathrm{Velocity}_{noSRPD})$$
$$\mathrm{Time} = \mathrm{Time}'*(\mathrm{Velocity}_{SRPD}/\mathrm{Velocity}_{noSRPD})$$
$$\mathrm{Time} = \mathrm{Time}'/(\mathrm{Velocity}_{noSRPD}/\mathrm{Velocity}_{SRPD})$$

because

$$\mathrm{Velocity}_{noSRPD}/\mathrm{Velocity}_{SRPD} = (1 + \mathrm{Velocity}_{noSRPD}{}^2/c^2)^{½}$$

Then,

$$\mathrm{Time} = \mathrm{Time}'/(1 + \mathrm{Velocity}_{SRPD}{}^2/c^2)^{½} \qquad \text{Equation 3}$$

Or

$$\mathrm{Time}_{noSRPD} = \mathrm{Time}_{SRPD}*(1 + \mathrm{Velocity}_{SRPD}{}^2/c^2)^{½}$$

The other equations, which use the SRPD/noSRPD labels, have the same logical structure. The mass distortion does not change the apparent velocity:

$\text{Mass}_{\text{noSRPD}}$ - Mass when there is no special relativistic distortion from an SRPD velocity viewpoint
$\text{Mass}_{\text{SRPD}}$ - Mass when there is special relativistic distortion from an SRPD velocity viewpoint

$\text{Mass}_{\text{SRPD}} = \text{Mass}_{\text{noSRPD}}/(1 - \text{Velocity}_{\text{noSRPD}}^{2}/c^{2})^{\frac{1}{2}}$ Equation 4

$\text{Mass}_{\text{SRPD}} * (\text{Velocity}_{\text{SRPD}} / \text{Velocity}_{\text{noSRPD}}) = \text{Mass}_{\text{noSRPD}}$
$\text{Mass}_{\text{SRPD}} / (\text{Velocity}_{\text{noSRPD}} / \text{Velocity}_{\text{SRPD}}) = \text{Mass}_{\text{noSRPD}}$
$\text{Mass}_{\text{noSRPD}} = \text{Mass}_{\text{SRPD}} / (\text{Velocity}_{\text{noSRPD}} / \text{Velocity}_{\text{SRPD}})$

To replace $(\text{Velocity}_{\text{noSRPD}} / \text{Velocity}_{\text{SRPD}})$, we use

$\text{Mass}_{\text{noSRPD}} = \text{Mass}_{\text{SRPD}}/(1 + \text{Velocity}_{\text{SRPD}}^{2}/c^{2})^{\frac{1}{2}}$ Equation 5

Although the length distortions will distort the apparent distance from the viewpoint of the moving body, the logic of the distance will remain the same:

$\text{Length}_{\text{SRPD}}$ - the length of a body under special relativistic distortion from an SRPD velocity viewpoint
$\text{Length}_{\text{noSRPD}}$ - the length of a body under no relativistic distortion for an SRPD velocity viewpoint

$\text{Length}_{\text{SRPD}} = \text{Length}_{\text{noSRPD}} * (1 - \text{Velocity}_{\text{noSRPD}}^{2}/c^{2})^{\frac{1}{2}}$ Equation 7
$\text{Length}_{\text{SRPD}} = \text{Length}_{\text{noSRPD}} * (\text{Velocity}_{\text{noSRPD}} / \text{Velocity}_{\text{SRPD}})$
$\text{Length}_{\text{noSRPD}} = \text{Length}_{\text{SRPD}} / (\text{Velocity}_{\text{noSRPD}} / \text{Velocity}_{\text{SRPD}})$
$\text{Length}_{\text{noSRPD}} = \text{Length}_{\text{SRPD}} * (\text{Velocity}_{\text{SRPD}} / \text{Velocity}_{\text{noSRPD}})$

After replacing $(\text{Velocity}_{\text{SRPD}} / \text{Velocity}_{\text{noSRPD}})$, we obtain

$$\text{Length}_{\text{noSRPD}} = \text{Length}_{\text{SRPD}} * (1 + \text{Velocity}_{\text{SRPD}}{}^2/c^2)^{½} \qquad \text{Equation 8}$$

According to the current equations, the velocity can appear to reach or exceed the speed of light from the viewpoint of a moving body because of relativistic distortions. The distortions in observed bodies are calculated with '$(1 + \text{Velocity}_{\text{SRPD}}{}^2/c^2)^{½}$' for a moving viewpoint to calculate the real velocity, i.e., the velocity with no relativistic distortions. The relativistic perspective equations determine the relativistic distortions from moving observation points.

The comparative values of the classic Einsteinian relativity equations and the relativistic perspective equations are velocity-dependent. The Einsteinian equations are more appropriate for low speeds. Motion is relative for any observation point, such as a planetary system, stellar system, galactic system, or galactic grouping. Thus, it is impossible to determine an exact 'velocity' value. If all the observed objects were to exhibit a large blue shift and include a point where that shift was the greatest, this pattern would indicate a relativistic time shift because of the velocity of the measuring device. However, if this effect is not observed, we can assume that the observation point is immobile and use Einsteinian equations. Alternatively, a combination of the Einsteinian and relativistic perspective equations should be used to estimate the speed and vector of the observed point for more rapid motions.

The relativistic perspective equations determine the appropriate relativistic values (for the velocity, time, mass, and length) from the corresponding non-relativistic values. These equations can then convert the relativistic numbers back to their original, non-relativistic values. Again, the relativistic perspective equations have been confirmed to be correct and consistent with the Classic equations to 2000 significant digits for 37 velocity values ranging from 1.0E-500 m/s to c – (1.0E-500) m/s; the confirmations are comprehensive and are available upon request. The values calculated to 2000 digits showed a maximum error of ±1.0E-1992, which was entirely due to the properties of irrational numbers. For the larger velocity values, any error is then multiplied by that larger velocity, which amplifies the error. Checking the error from a mass, time, or length value of '1' leads to the disappearance of the error.

2.2 Other Consequences of Relativistic Distortion

The above equations also suggest relativistic effects. The consequences of the motion of an object at a relativistic velocity are not completely recognised by science. The relativistic velocity would both:

a) Slow down the transmissions of all bosons: the photons (light), the gravitons (gravity), the gluons (strong nuclear force) and the W/Z bosons (the weak nuclear force, which is the force no one is really sure of). The absolute degree of that slowdown for different boson varieties is not completely documented in current science, but it is unreasonable to propose that some bosons would slow down and some would not slow down. This result would imply that the EM released by the Hubble objects at the edge of the universe would be moving slower because of relativistic distortions. The bosons emitted by any moving object will be slowed down by those distortions, which would also have the effect of reducing the frequency. This slowdown would imply that the bosons' mass is reduced as well. Indeed, this is one of the most fundamental tenets in all of physics: bosons are particles that have a zero mass when at rest.

b) The relativistic effects would also increase the mass of all the matter particles, as the mass from the bosons would have to be transferred somewhere.

The combination of the two points above would mean that any quantum-level interaction would be dealing with heavier particles with slower (and therefore, weaker) Bosonic forces. Time would not simply slow down, the interactions that maintain the structure of any macro-level device would also weaken. Thus, the object would not function as it did at rest.

The mass of the individual particles would increase, and the forces that maintained their quantum structures would weaken. There would perhaps be an equal balance of weakening between the repulsive force of the positive charge of protons and the bonding force of the Gluons. The lessening of both forces would mean an overall weakening of atomic structure. The increase of the mass of the particles would also mean that they would be colliding with greater kinetic force.

An illustrative parallel follows: a suspension bridge gains strength for its structure from both the gravitational forces pulling it down and the collective force of the component molecules, atoms, and sub-nuclear particles binding it together. These forces together mean that the structure possesses strength that greatly exceeds the forces acting against it (wind, the collective vehicle weight, and even seismic forces). Were you to cut both the gravitational and the particulate forces in half, then the arithmetic shows that the absolute excess of those forces would be halved as well. The bridge could perhaps hold the same number of cars, but it would take only half as much force for an earthquake to collapse it in this hypothetical scenario.

The alterations that occur at a very non-relativistic level would change the fundamental quantum interactions, but only to a marginal degree. An observed relativistic scale recession velocity could alternately indicate a relativistic scale distance and boson decay, not a universal expansion. Thus, alternate explanations for the increasing red shift of inter-galactic scale distances would be valid (i.e., EM frequency decay over those distances). This supposition will be examined more carefully in the following papers, beginning with A General Relativistic Perspective. Indeed, the frequency-decay supposition does not conflict with any conservation principles that are currently under consideration in science. A very fundamental fact of our observations has already been quantified: the Hubble Constant. Whereas the universe's expansion principle contests the one of the most fundamental principles in modern Science, matter/energy conservation, frequency decay does not. The decay would be a very tiny portion of the lessening of energy as any EM signal diffracts outward. The reader is again asked to consider which of the following suppositions are more reasonable:

a) The energy of the universe is increasing at an absolute (though un-harvestable) rate. Because this supposition sets absolutely no limit to the expansion, it is producing an infinite increase in energy/matter production.
b) Alternately, the energy we observe undergoes an inevitable frequency decay over great distances in a fashion that we directly observe and are able to quantify with what is known in current science as the Hubble Constant, for which the most recent value is 6.78E5 (m/s)/MPc. A Parsec is 3.085678E16 m, and hence, a MegaParsec is 3.085678E22 m. A reduction in frequency is brought about by a velocity of 6.78E5 (m/s)/MPc. The RATE of that decay can be calculated with what follows:

Δv – the apparent reduction in velocity

c - the speed of light (2.99 792 458E8m/s

d - the apparent distance increase

$\text{Hubble\_Frequency}_{\text{Decay}} = (\Delta v/c) / \Delta d$

$\text{Hubble\_Frequency}_{\text{Decay}} = (6.78\text{E}5/2.99792458) / 3.085678\text{E}22$

$\text{Hubble\_Frequency}_{\text{Decay}} = 7.32923061\text{E-}26$

An experiment to determine the validity of the above numbers could be performed simply by observing whether the frequency decayed by a proportion of 7.32923061E-23 (approximately 10 Septillionth) over one kilometre in a vacuum environment. Some may argue that such an experiment would also have to be done in an environment with a Planck's Constant-level gravity/escape velocity, but the author does not feel qualified to debate that supposition.

If it were argued that the expansion is space expansion and not <u>real</u> velocity, it would still have the effect of slowing the <u>transmission</u> of bosons. At any point in that expansion (presuming there is no relativistic distortion), the bosons would be measured as moving at the speed of light. However, during the time of that measurement, the space ahead of the bosons would have expanded. As a result, the signal would have farther to travel. Because of this expansion, the wavelength would increase, which completely matches our current observations. Nevertheless, this increase would mean that it would take considerably more than 13 billion years for light to reach us from the edge of reality. We would be seeing the same image (though it would be red-shifted), just as it is today. The question then becomes: how much longer than 13.75 billion years ago did the Big Bang event take place? Secondly, would the above result not imply (under <u>current</u> presumptions) that the progression of entropy would have gone much farther than is theorised today?

3.0 Summary

This paper has formulated additional relativistic equations that do not contradict Special Relativity. They are the same equations from a relativistic viewpoint. The equations presented examine special relativistic distortions from the perspective of the distorted object, and they determine the non-relativistic velocity from the observed velocity in the moving object. The values of the non-relativistic velocity and the apparent relativistic velocity it engenders share exactly the same validity. The equations relating these two perspectives are documented in this paper, the most crucial equation being:

$$\text{Time} = \text{Time'}/(1+\text{Velocity}_{\text{SRPD}}^2/c^2)$$

The equations formulated in this paper, relating different perspectives, can be reasoned as a justification for the determination of parallel equations in General Relativity. Any substantial additions to General Relativity would have some cosmological significance. Those additions are reasoned in The General Relativistic Perspective.

Note to Reviewer: A table of 39 $\text{Velocity}_{\text{noSRPD}}$ values Summary of Relativistic Perspective Equations and Confirmation Tables that confirms the velocity equations is available on the Internet at https://docs.google.com/document/d/1BZiB4uBUbSfLKc6jztZpiIed9AK-7otD0BRZnf2lwS4/