LORENTZ EQUATION REVISION

Einstein's Theory of Special Relativity uses the Lorentz Transformation Equation to predict physical changes for particles of matter as they are observed within a frame of reference.

As the velocity of a particle approaches the speed of light, the Lorentz Equation predicts that: 1) Its mass will increase, to become infinite at the actual speed of light, thus making this velocity unattainable for matter; 2) Its dimension in the direction of motion also approaches infinity; 3) That the measure or passage of time will decrease toward zero, reaching this value at the actual speed of light.

Relativity theory uses the concept of the frame of reference to define its effects. By definition, this frame always involves an observer and an observed. The velocity of a frame is the relative velocity between these entities. With respect to No. 1 above, this means that as the observed object or particle approaches the speed of light, the observer sees its mass increase toward infinity. If the positions of the observed and observer are reversed, the equations still hold.

The Lorentz Transformation Equation for relativistic changes Nos. 1 and 2 is:

$$A = A_o X \qquad 1.0$$

$$X = \frac{1}{(1 - v^2/c^2)} \qquad 1.1$$

Where: v = velocity of particle\object
c = velocity of light in vacuum
A_o = mass or length at: $v = 0$
A = mass or length at: $v = v$

If "A_o" is No. 3 above, the relativistic change is defined by the inverse quantity: X^{-1}.

After defining the effects of velocity on mass, distance (length), and time, Einstein went on to derive an equation that predicts increases in the kinetic energy of an accelerated particle. Let: KE = relativistic kinetic energy.
$KE_o = m_o c^2$, kinetic energy at: $v = 0$.

$$KE = KE_o (X - 1) \qquad KE = m_o c^2 (X - 1) \qquad 1.3$$

If: $v = 0$, Then: $X = 1$ And: $KE = 0$

This states that there is no increase in a particle's kinetic energy if it undergoes no acceleration and has no relative velocity in its frame of reference.

However, if: X = 2. Then: $KE = m_o c^2$ 1.4

This equates relativistic kinetic energy with mass.

Now let us define a general equation for all possible increases in relativistic kinetic energy in terms of a particle's velocity. Let: $Y = KE/KE_o$.

Then: $Y = X - 1$ And: $Y + 1 = X$

Expand:

$$(Y + 1)^2 = X_2 = \frac{c^2}{(c - v)^2} \qquad 1.5$$

$$(Y + 1)^2 (c - v)^2 = c^2 \qquad 1.6$$

Regroup: $$\frac{v^2}{c^2} = \frac{Y(Y + 2)}{(Y + 1)^2} \qquad 1.7$$

Or: $$v = +- \frac{c[Y(Y + 2)]^{½}}{Y + 1} \qquad 1.8$$

Equation 1.8 states that velocity can either be positive or negative. This means that the particle with the velocity is traveling through either positive (forward) space or negative (backward) space. This dual quality is also consistent with the work of Dirac, who predicted the existence of the electron's antiparticle, the anti-electron or positron. He saw this particle as having a backward movement in space and time.

Equation 1.7 will immediately be recognised as one of the key equations of quantum theory. In almost identical form, it is used to define the Lyman spectral series for the element Hydrogen:

$$E = hR \frac{Y(Y + 2)}{(Y + 1)^2} \qquad 1.9$$

Where: h = Plank's Constant; R = Rydberg Constant
Y = 1,2,3,...,n. whole number series

The series for the Lyman frequency series of electromagnetic radiation proceeds according to:

$$E = hR\ (3/4,\ 8/9,\ 15/16,...) = nhR$$

The equivalence between quantum theory and relativity theory occurs with the "Y" terms in Equations 1.9 and 1.7. Both are unitless numerical values, in the case of 1.7 representing whole numbered increases in a particle's relativistic kinetic energy, in the case of 1.9 merely whole numbers. In the latter case, this seems to suggest that the whole numbers that define the principle quantum energy states for the Hydrogen atom may also represent an increase in "something," an as yet unknown physical quality that electromagnetic energy is made up of.

When an electron undergoes acceleration, its kinetic energy increases with its velocity according to Equation 1.7, and at some critical velocity the increased kinetic energy is converted into the mass of a positron. The same event occurs for an accelerated proton, which produces an antiproton at the same velocity. Presumably, this would also happen to a neutron if it could be accelerated easily, and an antineutron would be the expected result. The coincidence of Equations 1.7 and 1.9 suggests that similar physical effects are occurring during the production of photons in the element Hydrogen.

Let "Y" increase by whole numbers: $m = m_o(1,2,3,...,\infty)$

m	v
$1m_o$	0
$2m_o$	$\sqrt{3}/2$ = .866..c
$3m_o$	$2\sqrt{2}/3$ = .94281c
4	$\sqrt{15}/4$ = .96825c
5	$2\sqrt{6}/5$ = .9798c
10	.995c
50	.9998c
100	.99995c
1,000	.9999995c
1,000,000	.9999999999995c
....	....
∞	c