# THE LORENTZ CALCULATION

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A fundamental concept associated with theory of Universal Exponential Expansion is that a mathematical procedure produced in the 19th century by Hendrik Lorentz is refuted. He based his logic upon the repeated inexplicable measurements of light speed as a constant regardless of the relative motion of the source and the detector.

It must be realized that the makeup of the universe at the time was, at best, sketchy. Not until the 1920's did Hubble's work become known, by which time relativity was firmly in place and special relativity was dependent upon Lorentz' work.

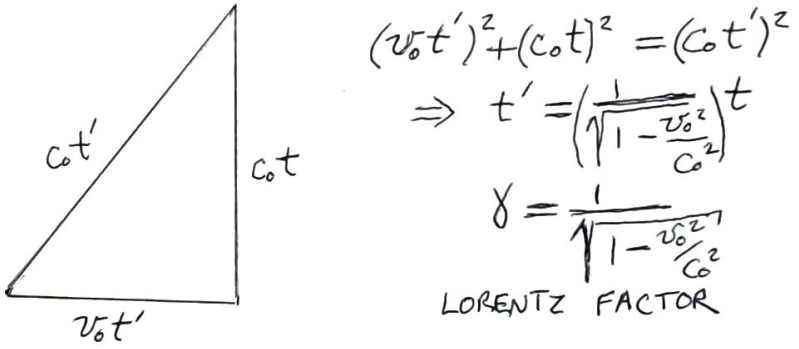
It is proposed that the "great mistake" in the mathematics of relativity and the Lorentz calculations is that they are based upon standard mathematics in an inertial frame of reference. If all matter and space in the universe is expanding exponentially, it is not possible to accurately describe cosmic occurrences with non-exponential mathematics. The Hubble-LeMaitre Law requires an exponential cosmic flow, with a constant Ho.

Because we exist under inertial conditions on the surface of the earth, it is difficult to imagine an all-encompassing exponential expansion. It is simpler to assume that the default condition for the universe is that Newton's laws approximately work, and Einstein's relativity will work for for extreme situations. But it is proposed herein that laws of motion for the universe must be formulated using exponential mathematics.

Assuming that light speed (c) is a constant, Lorentz used the distance formula: distance = velocity x time, and the Pythagorean formula: $A^2 + B^2 = C^2$ to arrive at his factor γ. In so doing, Lorentz compared the travel time of light rays in 2 inertial frames: 1 moving, and 1 stationary.

$$\gamma = \frac{1}{\sqrt{1-(\frac{v}{c})^2}}$$

Figure 1. A simple derivation of the Lorentz factor.




In figure 1, assuming a constant speed of light, and a variable time, the pythagorean theorem can be used to formulate gamma. t′ represents dilated time.

Because, at the time, there was no hint of an exponential expansion, Lorentz et. al. assumed the answer to the light speed problem could be found with a standard mathematical, non-exponential, calculation. His factor γ is used in Special Relativity to describe relativistic effects of time (dilation) , mass (increase) and length (contraction) when v becomes significant w.r.t. light speed.

The theory of exponential expansion refutes this approach. In the XPXP model, light speed increases exponentially. An exponential mathematical approach shows that an observer in any XPXP frame will measure light speed as a constant. The simplistic assumption that light speed is constant, resulting in time dilation and other relativistic effects, has misled physics from a true understanding of nature.