

D.G. Taylor - dgtaylor@telusplanet.net

Relativistic vs. non-Relativistic Space-Time Perspectives

Relativity equations examine Relativistic distortions from one perspective, the undistorted perspective. They determine relativistic values resulting from a |real|, non-relativistic velocity, one limited to light speed. Observations made from the moving body must have a different structure, evaluating data that is relativistically distorted. The combination of the |real| velocity and an unlimited time distortion means there is no theoretic limit to the apparent or |relativistic| velocity.

Special Relativistic Distortion (SRD) determines the relationship between real & apparent relativistic velocity. In Classic Special Relativity, |real| labels are approximates. All observable objects in the Universe are in motion. Determining an exact velocity or determining a zero velocity from the observed velocity is impossible – and so determining an exact relativistic effect is the same. |Rest/Real| labels are theoretical concepts, not confirmable data. But the relationship between relativistic and non-relativistic values is deducible:

c - speed of light (assumed 299,792,458 m/s)

Δtime - time passing on a moving body

$\Delta\text{time}'$ - real time taken for the “ Δtime ” value to pass

$\text{velocity}_{\text{real}}$ - observed velocity from no Special Relativistic distortion viewpoint

The Classic relativistic equation is not exclusively from the non-relativistic viewpoint. Δtime contains time passing on (seconds, minutes, hours, etc.) the relativistically distorted moving object. $\Delta\text{time}'$ holds the time on a non-moving/not under distortion body in terms of |real| time. So Classic relativity:

$$\Delta\text{time}' = \Delta\text{time}/(1-\text{velocity}_{\text{real}}^2/c^2)^{1/2}$$

- does not give values for the time passing in relativistic time. It shows how many undistorted non-relativistic time units that would pass for a given number of relativistic time units. The inverse equation would be of the more classic format: it would show the number distorted time units for a given number of real time units. If it takes twice as long for a relativistic time to elapse in terms of non-relativistic time, then there will be half as many relativistic time units. It is a fundamental that time moves more slowly under relativistic distortion; no matter how you define that distortion, lesser time will pass than would if the object were not under distortion. So define two more descriptive variables, ones recognizing a fewer number of |relativistic| seconds pass for any given number of |real| seconds.

$\text{numsec}_{\text{real}}$ - number of seconds passing from a perspective not under Special
Relativistic distortions

$\text{numsec}_{\text{relativistic}}$ - number of seconds passing from a perspective under Special
Relativistic distortions

Rewriting the equation:

$$\text{numsec}_{\text{real}} = \text{numsec}_{\text{relativistic}} / (1 - \text{velocity}_{\text{real}}^2 / c^2)^{1/2}$$

Inverting the equation so that it mirrors the other equations: instead of dividing the relativistic value by the relativistic distortion to calculate the real seconds you multiply the real seconds by the same distortion. So the equation becomes (in terms of seconds):

$$\text{numsec}_{\text{relativistic}} = \text{numsec}_{\text{real}} * (1 - \text{velocity}_{\text{real}}^2 / c^2)^{1/2}$$

Velocity is inversely related to passage of time: dividing both sides with 1m changes the equation so that it can determine relativistic/non-relativistic velocity instead of time distortion. Also make the $\text{numsec}_{\text{relativistic}}$ variable more specific and label it as the seconds passing under Special Relativistic Distortion (SRD):

$\text{numsec}_{\text{SRD}}$ - seconds passing for a body under Special Relativistic distortion from an SRD viewpoint

$$\text{numsec}_{\text{SRD}} = \text{numsec}_{\text{real}} * (1 - \text{velocity}_{\text{real}}^2 / c^2)^{1/2} \quad \text{Equation 1}$$

Divide both sides with 1 metre:

$$\text{numsec}_{\text{SRD}} / (1\text{m}) = (\text{numsec}_{\text{real}} / (1\text{m}) * (1 - \text{velocity}_{\text{real}}^2 / c^2)^{1/2})$$

Invert the equation:

$$1\text{m}/\text{numsec}_{\text{SRD}} = (1\text{m}/\text{numsec}_{\text{real}}) / (1 - \text{velocity}_{\text{real}}^2/c^2)^{1/2}$$

Set the variable $\text{numsec}_{\text{real}}$:

$$\text{numsec}_{\text{real}} = 1\text{m}/\text{velocity}_{\text{real}}$$

So

$$\text{velocity}_{\text{real}} = 1\text{m}/\text{numsec}_{\text{real}}$$

And

$$1\text{m}/\text{numsec}_{\text{SRD}} = \text{velocity}_{\text{real}} / (1 - \text{velocity}_{\text{real}}^2/c^2)^{1/2}$$

Defining another variable

$$\text{velocity}_{\text{SRD}} - \text{velocity observed from an SRD viewpoint}$$

And

$$\text{velocity}_{\text{SRD}} = 1\text{m}/\text{numsec}_{\text{SRD}}$$

So

$$\text{velocity}_{\text{SRD}} = \text{velocity}_{\text{real}} / (1 - \text{velocity}_{\text{real}}^2/c^2)^{1/2}$$

Everything in the Universe has some velocity. Defining points at rest (particularly when General Relativistic distortions are considered) is impossible. Determining the speed of light is done from a viewpoint assumed to have minimal/zero relativistic distortion.

So discard the |real| relativistic viewpoint and assume a theoretic one under no/zero Special Relativistic Distortion (noSRD). Zero velocity is absolutely indeterminate, but it is mathematically definable. 'F=ma' is an idealized criteria proposition. All forces acting upon a body cannot be determined perfectly: estimated but not without some inaccuracy. Newton's simplistic equation was not meant to allow for all force/acceleration vectors. Two equal exactly opposite vector forces would mean no acceleration. That would not mean there was no force acting on the object.

'F=GMm/r²' is the same – always more than two bodies of mass, exerting forces with different energy and vectors. But both equations are useful in predicting real actions and estimating all forces acting upon a body. So let us avoid using |real| or |rest| designations and presume a zero velocity/zero relativistic effects for two additional variables:

numsec_{noSRD} - seconds passing for a body under no Special Relativistic distortion

velocity_{noSRD} - velocity value with no Special Relativistic considerations

Using the reasoning in the velocity distortion equations:

$$\text{velocity}_{\text{noSRD}} = 1 \text{ m/numsec}_{\text{noSRD}}$$

So replacing $\text{velocity}_{\text{real}}$ with $\text{velocity}_{\text{noSRD}}$ means

$$\text{velocity}_{\text{SRD}} = \text{velocity}_{\text{noSRD}} / (1 - \text{velocity}_{\text{noSRD}}^2 / c^2)^{1/2} \quad \text{Equation 2}$$

To determine the inverse

$$\text{velocity}_{\text{SRD}}^2 = \text{velocity}_{\text{noSRD}}^2 / (1 - \text{velocity}_{\text{noSRD}}^2 / c^2)$$

$$\text{velocity}_{\text{SRD}}^2 * (1 - \text{velocity}_{\text{noSRD}}^2 / c^2) = \text{velocity}_{\text{noSRD}}^2$$

$$\text{velocity}_{\text{SRD}}^2 - \text{velocity}_{\text{SRD}}^2 * \text{velocity}_{\text{noSRD}}^2 / c^2 = \text{velocity}_{\text{noSRD}}^2$$

$$\text{velocity}_{\text{SRD}}^2 = \text{velocity}_{\text{noSRD}}^2 + \text{velocity}_{\text{SRD}}^2 * \text{velocity}_{\text{noSRD}}^2 / c^2$$

$$\text{velocity}_{\text{SRD}}^2 = \text{velocity}_{\text{noSRD}}^2 * (1 + \text{velocity}_{\text{SRD}}^2 / c^2)$$

$$\text{velocity}_{\text{noSRD}}^2 = \text{velocity}_{\text{SRD}}^2 / (1 + \text{velocity}_{\text{SRD}}^2 / c^2)$$

So

$$\text{velocity}_{\text{noSRD}} = \text{velocity}_{\text{SRD}} / (1 + \text{velocity}_{\text{SRD}}^2 / c^2)^{1/2} \quad \text{Equation 3}$$

Defining two more variables

$\Delta\text{time}_{\text{SRD}}$ - time passing in seconds under Special Relativistic distortion from an SRD velocity viewpoint

$\Delta\text{time}_{\text{noSRD}}$ - time in passing seconds under no Special Relativistic distortion from an SRD velocity viewpoint

The above was confirmed using the classic relativistic time distortion equation

$$\Delta\text{time}_{\text{noSRD}} = \Delta\text{time}_{\text{SRD}} / (1 - \text{velocity}_{\text{noSRD}}^2 / c^2)^{1/2}$$

– to calculate relativistic velocity by dividing the noSRD velocity by $\Delta\text{time}_{\text{SRD}}$ (fewer seconds passing in time_{SRD} means the apparent velocity increases). Relativistic velocity resulting from non-relativistic velocity was calculated; then the non-relativistic velocity was derived from that relativistic value. A range of real [noSRD] velocities was from 1.0E-500 m/s to $c - (1.0E-500)$ m/s, was checked to 2000 digits. Velocity is an observable distortion on a moving object. Apparent (SRD) velocity is immediately observable, sharing the above relationship with the noSRD velocity. The validity of observed Relativistic velocity is uncertain, but so is the real velocity used in velocity equations. The table for those confirmations is called

Gravitational distortion and Special Relativistic distortion form part of the entire visible environment. Zero velocity can be estimated, but the time equations in Special Relativity theory mean that all velocities have relativistic factors. So $\text{velocity}_{\text{real}}$ values used in any relativistic equation are approximate. The terms should not be |relativistic| and |real| but rather |relativistic| and |non-relativistic|. Any outside observed velocity is as valid as a relativistic velocity. The

sole issue is the precision of the value. For lower velocities: |noSRD|. For higher velocities |SRD| is better, indicating the need for conversion to a non-relativistically distorted value, to make it more accurate – but still not absolutely precise.

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

The mass equations:

mass_{SRD} - mass of a body under Special Relativistic distortion from an SRD velocity viewpoint

$\text{mass}_{\text{noSRD}}$ - mass under no Special Relativistic distortion from an SRD velocity viewpoint

$$\text{mass}_{\text{noSRD}} = \text{mass}_{\text{SRD}} / (\text{velocity}_{\text{SRD}} / \text{velocity}_{\text{noSRD}})$$

$$\text{mass}_{\text{noSRD}} = \text{mass}_{\text{SRD}} / (\text{velocity}_{\text{SRD}} / (\text{velocity}_{\text{SRD}} / (1 + \text{velocity}_{\text{SRD}}^2/c^2)^{1/2}))$$

$$\text{mass}_{\text{noSRD}} = \text{mass}_{\text{SRD}} / (1 + \text{velocity}_{\text{SRD}}^2/c^2)^{1/2} \quad \text{Equation 4}$$

And

$$\text{mass}_{\text{SRD}} = \text{mass}_{\text{noSRD}} * (1 + \text{velocity}_{\text{SRD}}^2/c^2)^{1/2} \quad \text{Equation 5}$$

The length equations

length_{SRD} - length of a body under Special Relativistic distortion from an SRD
velocity viewpoint

length_{noSRD} - length of a body under no relativistic distortion for an SRD
velocity viewpoint

$$\text{length}_{\text{noSRD}} = \text{length}_{\text{SRD}} * (\text{velocity}_{\text{SRD}} / \text{velocity}_{\text{noSRD}})$$

$$\text{length}_{\text{noSRD}} = \text{length}_{\text{SRD}} * (\cancel{\text{velocity}_{\text{SRD}}} / (\cancel{\text{velocity}_{\text{SRD}}} / (1 + \text{velocity}_{\text{SRD}}^2 / c^2)^{1/2}))$$

$$\text{length}_{\text{noSRD}} = \text{length}_{\text{SRD}} * (1 + \text{velocity}_{\text{SRD}}^2 / c^2)^{1/2} \quad \text{Equation 6}$$

And

$$\text{length}_{\text{SRD}} = \text{length}_{\text{noSRD}} / (1 + \text{velocity}_{\text{SRD}}^2 / c^2)^{1/2} \quad \text{Equation 7}$$

By current equations, the velocity can appear to reach or exceed light speed from the viewpoint of a moving body because of relativistic distortions. Distortions in observed bodies are then calculated with $|(1 + \text{velocity}_{\text{SRD}}^2 / c^2)^{1/2}|$ for a moving viewpoint to calculate the real velocity – the velocity without relativistic distortions. Relativistic Perspective equations determine relativistic distortions from moving observation points.

The comparative value of the Classic Einsteinian Relativity equations and Relativistic Perspective equations is velocity dependent. Einsteinian equations are more appropriate for low speeds. Motion is relative in any observation point (planetary, stellar system, galactic system, galactic grouping) so it is impossible to know the exact value for velocity. If all observed objects

show a large blue shift - including a point where that shift was highest – that would indicate a relativistic time shift because of the velocity of the measuring device. If that is not observed, assume the observation point is immobile and use Einsteinian equations. Alternatively large motions should use a combination of the Einsteinian and the Relativistic Perspective equations to estimate the speed and vector of the observed point.

Relativistic Perspective equations determine relativistic values (velocity, time, mass, and length) from corresponding non-relativistic values. Then convert those relativistic numbers back to original non-relativistic values. Again, Relativistic Perspective equations are confirmed correct to 2000 significant digits for 39 velocity values ranging from $1.0E-500$ to $c-(1.0E-500)$. The confirmations are comprehensive and here in the 21st I have set up a site on the net so all can see them. Those 2000 digit values showed a maximum error of $\pm 1.0E-1992$. That error was entirely because of the properties of irrational numbers; values calculated to 100 digits showed a maximum error of $\pm 1.0E-92$, the same values done to 1000 digits, showed a maximum error of $\pm 1.0E-992$. For the larger velocity values any error is then multiplied by that high velocity - amplifying the error. Checking the equation for a mass/time/length value of 1 led to the disappearance of the error.

Summing up. There are additional Relativistic equations. The equations do not contradict Special Relativity, but are equations from a Relativistic viewpoint. The value of the non-relativistic velocity and the apparent relativistic velocity it engenders has exactly the same validity. Moreover, those equations have implications for the relativistic contradictions in current Big Bang theory.