

For churingapublishing website by AC Sturt 27 September 2006

GB0324124.7 – Measurement of Velocity through Space

Final description of logic behind invention. See also New Model of Physics under

Radioactive Clocks application.

I need to lay out the sequence of logic behind the invention, because as I have pointed out throughout the application, it is based on my new, deterministic model of physics, which is different from Einstein's Special Theory of Relativity, and this may answer some of your objections.

It is said that the velocity of light in vacuo is always constant irrespective of the velocity of the source or the observer. My interpretation of the same measurements is that the velocity of light in vacuo always appears to have the same velocity relative to source and observer by the methods currently used for detection, which is not at all the same thing.

I am adding nothing new, because this has all appeared in papers which I have submitted for publication, most of which are also on my personal website www.churingapublishing.com to which I have previously drawn attention. I also sent you paper copies of two of the most relevant papers as attachments to my letter of 26 October 2004:

- a. Mass in the Universal Inertial Field – A Revised Version by A.C. Sturt
18 September 2003. www.churingapublishing.com/numass_1.htm.
- b. An Electrodynamic Model of Atomic Structure by A.C. Sturt
3 October 2003. www.churingapublishing.com/dynamat_1.htm

It is particularly relevant that I am using the term “space” to mean a medium of space with electromagnetic properties, as in fact did Faraday. In this sense “in vacuo” means

the absence of matter, not total void. This can be spelled out by substituting “the medium of space” for “space” in the claims, if necessary, but it has been cited in the above publications.

On this basis the answers to some of your comments become apparent from the following sequence of analysis.

1. There is always a velocity with respect to which all other velocities can be measured: the velocity of light in vacuo.
2. This velocity results from the electromagnetic interaction of light with the medium of space, which is Universal. Thus the velocity of light in vacuo is always the same, everywhere and at all times.
3. This velocity of light is measured at $3 \times 10^8 \text{ ms}^{-1}$ on Earth, using the standard metre rule and the astronomical second (avoiding atomic clocks for reasons given below). Thus there is a Universal scale on which velocities can be expressed: $0 - 3 \times 10^8 \text{ ms}^{-1}$.
4. For example, if the velocity of light in vacuo in another part of the solar system, galaxy or Universe etc was found by such measurement to be $2 \times 10^8 \text{ ms}^{-1}$, the conclusion by Newtonian relative velocities would be that this particular place in the solar system, galaxy, Universe etc had a velocity through (the medium of) space of $1 \times 10^8 \text{ ms}^{-1}$ measured with the metre rule and the astronomical second.
5. The problem is that it is extremely difficult to measure the velocity of light in this way with sufficient accuracy except on Earth. The first requirement is an accurately measured distance which has to be long because the velocity is so great. Such distances e.g. to the Moon are now calculated using the speed of light as measured on Earth, which begs the question. Secondly, there is the need to measure extremely short time-intervals, which is all but impossible without atomic clocks.

However, time-intervals measured by such clocks vary with their position in space (clocks in GPS satellites run slower than on Earth), and so it is impossible to unravel time from velocity effects, which confounds the results. The easy way is to multiply by a relativistic correction factor, but we have rejected Relativity. In any case such a factor will certainly vary with the place in the solar system, galaxy, Universe etc, because in these terms the distance of a GPS satellite from Earth cannot be considered to represent them all; it obviously does not represent the surface of the Earth or the clocks would not run slow.

6. The solution adopted has been to measure the wavelength of light rather than its velocity using cavities etc or to calculate it from theories of electromagnetic radiation which also have their own assumptions. If velocity in vacuo is constant and wavelength emitted by a source or absorbed by a receptor is constant irrespective of their motion, the laws of Newtonian physics do not

apply. Hence the Theory of Relativity. However, the use of wavelengths is misleading for the reasons which follow.

7. My proposition, which can be supported by measurements rather than hypotheses, is that this model of light is simply a misinterpretation of the measurements. The mechanism of emission or absorption of a particle of light is orbital interaction, not the relative velocities of Newtonian mechanics. A particle of light is emitted when electrons change atomic orbits. The wavelength of the emission depends on the velocities of the electron in these orbits i.e the energy change resulting from atomic structure, not the velocity of the atom itself through space. As soon as the particle of light separates from the atom which is the source, it travels through the medium of space at the constant velocity of $3 \times 10^8 \text{ ms}^{-1}$. When the particle of light arrives at a detector or observer, it sets up a resonance with the electronic structure i.e. it is seen. The process of resonance does not involve the velocity of light relative to the detector/observer, though this velocity may determine whether the light is "seen" or not.

It is not surprising, therefore, that measurements of wavelength do not detect the motion of source or detector. Their velocities relative to the particles of light which they emit or absorb have to be measured geometrically by Newtonian methods i.e. distance travelled in unit time, which is not easy to arrange.

8. This reasoning applies to particle theories of light, whether Einstein's photons or, as I propose, rotating electrodynamic dipoles (REDs), which are mentioned in the cited paper An Electrodynamic Theory of Atomic Structure. It also applies to very short bursts of light in the form of waves, because they would still have to interact with the electronic structures of atoms. (A continuous stream of light would obscure the effect).

The next step in the analysis is to relate light to the velocities and acceleration of particles of mass through the medium of space. The force needed to cause acceleration of a particle of mass increases rapidly with velocity. In my analysis this is because of increasing inertial resistance from the medium of space. The curve of force increasing with velocity is a hyperbola with the velocity of light as an asymptote which cannot be exceeded. The relativistic equations have the same form, but the increased force is attributed to increasing mass, which I believe to be nonsense. It can be shown separately that time and length do not dilate, in which case neither can mass.

The alternative which I have proposed is that interaction with the medium of space causes accelerating particles of mass to shed energy as electromagnetic disturbances or REDs i.e. light. The wavelength of this emitted light depends on the velocity from which the particle is accelerated: the greater the velocity, the greater the inertial resistance, the more force needed and so the greater the energy required to produce acceleration. This energy therefore has two components: the increase of kinetic energy, as in the Newtonian model, and energy which is dissipated by acceleration against resistance from the medium of space in the form of electromagnetic disturbance i.e. the RED. As the force required for acceleration increases, the energy

of the electromagnetic emission increases disproportionately, and so by the Planck equation does its frequency. This increase is occurring over the whole range of velocities from $0 - 3 \times 10^8 \text{ms}^{-1}$, so that the wavelength of light emitted on the acceleration of a particle of mass is correlated with its velocity through the medium of space, which is in effect relative to the constant velocity of light in vacuo.

The result is that when a particle of mass travelling at a velocity is caused to accelerate just enough to emit a particle of light, the wavelength of light emitted is characteristic of that velocity, and so the velocity of the particle of mass through the medium of space can be identified. Hence the calibration process described in the application.

Quite separately, devices are known which produce charged particles of mass which have a calculable velocity relative to the device by the use of magnetic and electric fields. This is the basis of mass spectrometry, and in fact Thomson made the first measurement of the charge of an electron in such an apparatus.

To address the other points raised, particles manufactured for the purpose are always charged because there is no other practical way to accelerate them. Astronomical explosions would not have this limitation. The new model suggests that all particles of mass, charged and uncharged, must shed electromagnetic energy on acceleration, or they would be able to exceed the velocity of light, which is not the evidence. At velocities up to about a third of the speed of light the component of electromagnetic energy would be hard to distinguish, because the increase in inertial resistance from the medium of space is very small, and so the wavelength would be very long, well into the radio region.

Finally there are arguments relating to astronomical redshift, which Hubble claimed to indicate not only a star's distance but its velocity. This appears to contradict the proposition that the wavelength of light emitted by a body is independent of the motion of the source. However, it is perfectly easily explained in the new model of physics proposed here. Redshift occurs because the rate of rotation of electromagnetic dipoles decreases with distance travelled through space. In this case redshift indicates the distance of stars, not their velocity. I have proposed measurements to test this.

The emission of electromagnetic energy by accelerating bodies forms a fundamental part of the process of regeneration and redistribution of matter and energy in a steady state Universe, as described in my paper *The Timeless Universe I A Model of Stochastic Regeneration and Redistribution* (22 September 2001), also submitted to journals for publication and published on my personal website at www.churingapublishing.com/timeless_1.htm. This phenomenon is not unlike the *bremstrahlung* of particle physics, but a much broader concept.

I hope all this clarifies the argument relating the new model of physics to the application, which is:

- a device produces particles of mass with velocity known relative to the device.
- the particles of mass are then caused to accelerate just sufficiently from this velocity to cause the emission of radiation.

- the wavelength of this radiation is correlated with particle velocity through the medium of space from the calibration chart.
- the difference between the two particle velocities i.e. relative to the device and relative to the medium of space must then be the velocity of the device through the medium of space.

No “frame of reference” is required other than the constant velocity of light in vacuo. This is the sort of device to use in a spacecraft out of sight of land.

Papers produced by the search so far are obviously based on the conventional model of physics, including the Special Theory of Relativity, and so they do not seem to me to be at all relevant to the invention.

A.C. Sturt

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