Evidence for Newtonian Absolute Space and Time

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The permanency of the celestial sphere is a result of a cosmological limit velocity for all bodies relative to absolute space. Neomechanics, prescribing momentum as $m\mathbf{v}\big/\sqrt{1-v^2/c^2}$, where v is the absolute velocity, accounts for the cosmological limit velocity as c. Local laws of physics must then involve absolute velocities. The Monstein-Wesley experiment confirms neomechanics. Absolute accelerations imply absolute space. Newtonian mechanics requires absolute space. Relativity theories can only be approximately valid for slowly varying effects. The oneway energy velocity of light, having the velocity **c** with respect to absolute space, has the observed velocity $\mathbf{c}^* = \mathbf{c} - \mathbf{v}$, where **v** is the absolute velocity of the observer, as confirmed by many experiments. The Voigt-Doppler effect yields the null Michelson-Morley result. Absolute time is established by induction from corrected synchronized clock rates.

1. The Celestial Sphere Defines a Cosmological Limit Velocity and Absolute Space

The distant stars and galaxies that constitute the celestial sphere appear to be permanently fixed in position relative to each other. This permanency can only arise if the velocity of every body in the universe does not exceed some common finite limit velocity. If no limit existed and all velocities were equally likely, then the celestial sphere would appear like a swarm of gnats rushing wildly about at random. Since the limit velocity applies to every body in the universe; the limit velocity for each body must be measured with respect to a single unique zero velocity frame, that then defines absolute space.

2. Physical Laws Must Depend upon the Cosmological Limit Velocity and Absolute Space

Physical laws governing the motion of bodies must be such that no individual body can ever exceed the absolute finite cosmological limit velocity. Local laboratory physics must thus include explicitly this cosmological limit velocity. This means that the precise laws of physics will depend upon absolute space. Local laboratory physics must thus depend upon the absolute velocity of the laboratory. This further means that the laws of physics cannot be the same in different inertial frames with different constant uniform absolute velocities.

3. Neomechanics Yields the Cosmological Limit Velocity as c

Since the time of Newton (1730) there has been speculation that matter with mass m can be converted into radiant energy E; thus,

$$E = mk, \tag{1}$$

where k is some constant. Toward the end of the last century this coefficient was generally speculated to be c^2; so

$$E = mc^2. \tag{2}$$

By the 1930's nuclear and particle physics established the correctness of mass-energy equivalence with the coefficient c^2 (to about a 2 place accuracy).

"Neomechanics" is defined here as mechanics hased upon mass-energy equivalence in absolute space and time that reduces to Newtonian mechanics for small velocities, $v/c \ll 1$. In particular, the mass to be associated with a kinetic energy K is K/c^2. This means that a change in momentum $\mathbf{p}$ of a particle of rest mass m is given by

$$\mathrm{d}\mathbf{p} = \mathrm{d}[(m + K/c^2)\mathbf{v}]. \tag{3}$$

The corresponding change in kinetic energy dK is then given by

$$\mathbf{v}\bullet\mathrm{d}\mathbf{p} = \mathrm{d}K = \mathbf{v}\bullet\mathrm{d}[(m + K/c^2)\mathbf{v}]. \tag{4}$$

Integrating Eq.(4), choosing the constant of integration such that $K = 0$ when $\mathbf{v} = 0$, yields

$$K = mc^2(\gamma - 1), \tag{5}$$

where

$$\gamma = \frac{1}{\sqrt{1 - v^2/c^2}}. \tag{6}$$

The neomechanical momentum then becomes

$$\mathbf{p} = m\gamma\mathbf{v} = \frac{m\mathbf{v}}{\sqrt{1 - v^2/c^2}} \tag{7}$$

And Newton's second law becomes

$$\mathrm{F} = \mathrm{d}\mathbf{p}/\mathrm{d}t = \mathrm{d}(m\gamma\mathbf{v})/\mathrm{d}t. \tag{8}$$

The velocity **v** appearing in these expressions (3)-(8) is the absolute velocity of the mass m.

These neomechanical results for the kinetic energy and momentum, Eqs.(5) and (7) go to infinity as v approaches the absolute velocity c. Since there is no infinite source of energy to give a single body infinite kinetic energy; and since no infinite forces exist in nature that can accelerate a single body to an infinite momentum; the absolute velocity of any body with rest mass m must always remain less than the limit velocity c. This result then says that neomechanics yields the absolute cosmological limit velocity as c.

4. The Monstein-Wesley Experiment Confirms Neomechanics

Monstein and Wesley (1996) measured the anisotropy of the cosmic-ray muon flux using a cosmic-ray telescope to obtain the absolute velocity of the solar system. In particular, taking into account the statistical neomechanics for the decay rate of moving radioactive particles, the half-life is given by

$$\tau = \tau_o \gamma = \frac{\tau_o}{\sqrt{1 - v^2/c^2}}, \qquad (9)$$

where τ_o is the half-life for a stationary particle and v is the absolute velocity of the particle (Wesley 1991).

In terms of the muon velocity relative to the Earth $\mathbf{v}'$ and the absolute velocity of the Earth $\mathbf{v}_e$ the absolute velocity squared to be used in Eq.(9) becomes

$$v^2/c^2 = (\mathbf{v}' + \mathbf{v}_e)^2/\mathbf{c}^2 \approx \mathrm{v}'^2/c^2 + 2\mathbf{v}' \bullet \mathbf{v}_o/c^2, \qquad (10)$$

where v_e^2/c^2 has been neglected compared with the terms retained and where the absolute velocity of the Earth is approximately equal to the velocity of the solar system, $\mathbf{v}_e \approx \mathbf{v}_o$, the absolute solar system velocity $\mathbf{v}_o$ being of the order of 300 km/s (A slight improvement can be expected by also including the known orbital velocity of the Earth about the Sun.).

From the theory for the expected sea-level muon flux as a function of τ and thus of $2\mathbf{v}' \bullet \mathbf{v}_o/c^2$ and from 32,400 coincident counts registered by the telescope collected over 18 years the magnitude and direction of the absolute velocity of the solar system $\mathbf{v}_o$ was found to be that presented in Table 1.

This result is in reasonable agreement with the values of $\mathbf{v}_o$ obtained by other methods. This means that the velocity to be used in the gamma factor γ, Eq.(6), is, in fact, the absolute velocity of the body or particle, thereby confirming neomechanics. In addition, the Monstein-Wesley experiment demonstrates the fact that the absolute velocity of the local inertial frame or laboratory is explicitly involved in the local laws of physics.

5. Absolute Accelerations Imply Absolute Space

Newton's second law reveals absolute accelerations. This permits one to speak of "inertial frames" that are not accelerating. For each point in the

Table 1. Observed values of the absolute velocity of the solar system

method	observer	v_o km/s	α_o hr	δ_o deg
Galactic red shifts anisotropy	De Vaucouleurs & Peters (1968)	300 ± 50	7 ± 1	50 ± 10
	Rubin *et al*. (1976)	600 ± 100	2 ± 2	50 ± 20
2.7 K cosmic background anisotropy	Conklin (1969) from ground	200 ± 100	13 ± 2	30 ± 30
	Henry (1971) from balloon	320 ± 80	10 ± 4	–30 ± 25
	Smoot *et al*. (1977) from airplane	390 ± 60	11.0 ± 0.5	5 ± 10
oneway light velocity anisotropy	Marinov (1974) coupled mirrors	300 ± 20	13.3 ± 0.3	–20 ± 4
	Marinov (1984) toothed wheels	360 ± 40	12 ± 1	–24 ± 7
	Müller (1994) Geostationary satellite time signals	250 ± 50	6 ± 1	–14 ± 3
muon flux anisotropy	Monstein& Wesley (1996)	360 ± 180	9 ± 4	–1 ± 10

universe a nonaccelerating inertial frame may be chosen with some arbitrary constant uniform velocity $\mathbf{v}_{0i}$ Since all points in the universe are equivalent in a uniform isotropic universe; there can be no priviledged point with some priviledged velocity with some priviledged direction. Thus, the constant uniform velocity to be associated with each point in space must be the same and must be zero in a universe with no preferred direction; thus,

$$\mathbf{v}_{0i} = \mathbf{v}_0 = 0. \tag{11}$$

The inertial frame with this unique zero velocity, that can be assigned to every point in the universe, defines absolute space.

6. Newtonian Mechanics Requires Absolute Space

Newtonian mechanics involves integrals of the motion that involve velocities of bodies. The values of these velocities are valid only for a particular inertial frame with a particular constant uniform velocity. These integrals of the motion involving the velocities of bodies must take on different values in different inertial frames with different constant uniform velocities. For Newtonian mechanics to be valid for the universe as a whole a single unique inertial frame for the whole universe must be chosen, which to preserve isotropy, must be a zero velocity frame or absolute space.

In neomechanics the absolute velocity is involved in Newton's second law, Eq.(8), itself; so the need for absolute space is not limited to merely the integrals of the motion.

7. Relativity Theories Are Insufficient

Relativity theories assume fundamental laws of physics can be deduced from the interaction between two bodies, which involve only their relative position, their relative velocity, and their relative acceleration.

Such theories obviously cannot account for the absolute cosmological limit velocity; since absolute velocities and absolute space are not involved.

Such theories involve action at a distance, such as Coulomb's law or Newton's law of universal gravitation. From symmetry involving two bodies the action of one body on the other must be assumed to occur instantaneously. Relativity theories cannot incorporate radiation or action transmitted with a finite velocity. Such theories require no propagating fields nor any fields at all.

Relativity, such as classical celestial mechanics, works as an approximation, where the time for the transmission of action between two bodies may be neglected as small. In particular, the finite velocity of action compatible with the cosmological limit velocity may be taken as c; so the relativity approximation works when

$$R/c << \Delta t, \tag{12}$$

where R is the separation distance between the two bodies and Δt is the shortest time interval observed or that is of interest. Thus, relativity theories are approximately valid for slowly varying effects.

Generally only the velocity of a particle relative to the laboratory is used in the γ factor, Eq.(6), instead of the absolute velocity required by neomechanics. This does not produce any large error; since the absolute velocity of the laboratory is approximately that of the solar system which is small compared with c, or $v_0/c \sim 10^{-3}$. However, opprotunities to measure the absolute velocity of the solar system by using a little care are thereby overlooked.

8. The Oneway Energy Velocity of Light Reveals Absolute Space

The oneway energy velocity of light is empirically found to be $\mathbf{c}$ with respect to absolute space. If an observer has the absolute velocity $\mathbf{v}$, then the apparent oneway energy velocity of light is observed to be

$$\mathbf{c}^* = \mathbf{c} - \mathbf{v}, \tag{13}$$

where $\mathbf{c}$ and $\mathbf{v}$ are chosen positive in the same direction. This formula (13) accounts trivially for the observations of Roemer (1677), Halley (1694), Bradley (1728), Sagnac (1913), Michelson-Gale (1925), Conklin (1969), who first observed the 2.7 K cosmic background anisotropy, Marinov (1974) with his coupled mirrors experiment, Marinov (1984) with his toothed wheels experiment, and Müller-Dale (1994) with the use of geostationary satellite time signals.

The failure of the Michelson-Morley experiment to detect the absolute velocity of the set-up was predicted by Voigt (1887) as a Doppler effect for light in absolute space and time before the experiment had even been performed. Michelson expected a positive result; because he erroneously considered the oneway velocity of energy propagation instead of the phase velocity. The setup is only sensitive to the phase velocity; and in Doppler effects the phase velocity need not have the same magnitude nor direction as the oneway velocity of energy propagation. A thorough analysis of the Michelson-Morley experiment has been made by Wesley (1984). (Voigt's unfortunate mathematical representation of his Doppler effect in space and time variables, yielding the so-called "Lorentz transformation," instead of in the propagation constant and frequency, gave rise to the strange idea that space and time could themselves somehow change in a moving system, as is now assumed in "special relativity").

9. Absolute Time

The concept of time is an abstraction by induction from the observation of many different processes occurring in nature. It is found that periodically reproducible processes can be compared and synchronized with each other to establish a universal time. It is thus possible to construct clocks that have steady reproducible periodic behavior. The fact that standard clocks can be constructed (at least in principle) to run at constant rates independent of their location in the universe, the date, the gravitational field, the velocity, the acceleration, and other such extraneous conditions defines by induction the concept of absolute time.

The peak frequency of the 2.7 K cosmic background radiation provides in principle a single unique clock that can be seen and used by all observers anywhere in the whole universe to establish an absolute unit of time.

The naturally occurring frequency of a spectral line of Hydrogen can also be used to define a universal unit of time valid on any distant star or galaxy. Such clocks on distant stars and galaxies when viewed on the Earth must be corrected for the cosmological redshift, the gravitational redshift, and Doppler shifts. The reliability of such atomic clocks may also be used as possible evidence for the distance, the gravitational field, or the velocity of the distant star or galaxy.

The most accurate practical standard unit of time today on the Earth is given by cesium beam clocks that have practical fractional accuracies of about 10^{-13}.

A clock based on the half-life of a radioactive element, would have to be corrected for its absolute velocity using Eq.(9). On the other hand, a clock based upon the resonating frequency of an electrodynamic standing wave in a cavity is not sensitive to its absolute velocity and does not need the correction given by Eq.(9).

There is no known or conceiveable natural phenomenon that necessitates the idea that time itself must run faster or slower under certain circumstances; because appropriate corrections can always be introduced to yield synchrony with ordinary accurate clocks.

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