Measuring the Sun's Absolute Velocity through the Quantum Medium

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This paper introduces a simple yet revealing experimental apparatus — referred to here as the vSa, or (absolute velocity of the Sun) apparatus. The experiment is designed to detect the Sun's absolute velocity (vSa) through the hypothesized quantum medium (qm). According to the Quantum Medium View (QMV or qmv), such motion affects the rates of all physical processes, including clocks. Detecting these effects could have profound implications for our understanding of relativity, time dilation, inertial frames or systems, and *measured* light speed, c (lsc).

The vSa experiment stands within a much broader conceptual framework. The QMV is not merely a reinterpretation of relativity, but a physical theory positing that a quantum medium pervades space and transmits all energy exchanges. It offers explanations for many phenomena that current theory treats as paradoxes or correlations or axioms like light speed c. One aim of this document is to present the vSa experiment as a targeted test of QMV's predictions. Another is to show how the QMV can unify our understanding of diverse physical behaviors, from time dilation and gravitational redshift to anomalous galactic rotation.

The Apparatus and Principle

The apparatus consists of two radar-equipped space stations, O and P, positioned 20,000 km apart in free space, as shown in Figure 1. A spacecraft carrying a single highly accurate clock (Cc) travels from space station O to station P at a constant 4.5 km/s velocity, carefully controlled via radar ranging from O and P. Upon reaching P, the spacecraft makes a powered U-turn and returns from P to O with the same radar-controlled speed. The key measurement is the time recorded by clock Cc during each leg of the round trip.

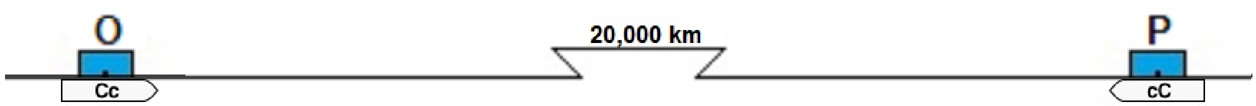

Figure 1

In the QMV, the spacecraft and clock returning from P to O differ from the O to P craft and clock. The reason is that the speed of the spacecraft and Cc *through the qm* will never be the same for the two legs of the trip; the apparatus can never be perfectly at rest in the qm. In the QMV, all mass-energy (m-e) in the spacecraft is constantly exchanging m-e with other m-e, and *these exchanges occur via the qm*.

These interactions include photons and other particles, and the Doppler shifting that occurs via the qm during emission and absorption. When systems of m-e move rapidly through the qm, these energy shifts become greater, and the rate of round-trip (RT) energy exchange slows, and it slows most along lines parallel to the direction of a system's absolute velocity (va) through the qm. This phenomenon is analogous to slowed RT boat traffic on a river where the *RT slowing* depends on the river's speed, and is slowed most up and down the river and least across the river and back.

Labeling the single clock "Cc" emphasizes the QMV prediction**:** the clock's rate depends on its absolute velocity through the qm. Because the spacecraft's motion through the qm differs on the outbound and return legs, the rates of the clock are expected to differ as well. The root cause is that the rate of evolution of any m-e system depends on its speed through the qm. The faster a mass-energy system moves through the qm, the slower the RT energy exchange rate in the system and the slower its internal processes.

Foundational Premise of the QM

Premise 1 of the QMV states that our universe includes a quantum medium that pervades all space, and that light travels through this medium with a maximum absolute speed, ca, when not impeded by other m-e. This concept echoes the thinking of 1800s physicists and is not radical. But the consequences are profound**:** the slowing of all evolving processes moving through the qm, consistent with observed time dilation, foreshortening, and apparent mass increase. All these observed phenomena have a common factor: the physical change ratio, rv, which is a function of a m-e system's *absolute velocity, va, through the qm***:**

$$rv = \sqrt{(1 - va^2)}$$

This equation allows estimation of vSa by measuring how the clock Cc's time changes based on its assumed motion *relative to the* qm. For instance, aligning the OP axis with the CMB dipole gives a possible vSa of ~ 0.001 ca. Clock readings from a round trip at 0.000015 c yield rv ≈ 0 if the apparatus is at rest in the qm. But if the apparatus has a 0.001 ca velocity:

$$\text{rv for apparatus} = \sqrt{(1 - 0.\mathbf{001^2})} = 0.9999995$$

And adjusting for the vca = 0.001015c outbound and vCa = 0.000985c inbound legs:

$$rv\mathbf{c} = \sqrt{(1 - 0.001015^2)} = 0.999999\ \mathbf{484887} \quad \text{and} \quad rv\mathbf{C} = \sqrt{(1 - 0.000985^2)} = 0.999999\ \mathbf{514887}$$

And the difference in times on clocks C and c during ~ 4,444.44 s of clocks OP travel time is**:**

t**C**=(4,444.44•.999999514887)=4444**.4378439 s − t**c=(4,444.44•.999999484887)=4,444**.4377106 s**

which is **0.0001333 s** and is certainly detectable when a vSa component is .001 ca.

The following table shows the importance of the O-P apparatus having some components of vSa be at least .001 ca through the qm

vSa sa	rv	(C−c) travel time difference in s
0.0005	.999999 8750	.0005555564
0.0010	.999999 5000	.0022222224 or 4x the prior (C−c)
0.0020	.999998 0000	.0088888893 and 4x more
0.0040	.999992 0000	.0355555584 and 4x more
0.0080	.999968 0000	.1422222316 and 4x more

Implications for Mass-Energy Systems

The same increase in absolute motion that slows clocks also causes the asymmetrical contraction of all m-e systems, and an increase in the system's mass. These are not separate effects, but consequences of the same anisotropic slowing of RT energy exchange. When a m-e system experiences anisotropic RT slowing, it foreshortens to restore isotropy and stability of the system. This dependence of all m-e systems on their "absolute motion" (i.e. through the qm) is what the vSa experiment aims to show. Many past experiments have shown such dependence.

Hafele and Keating experiment, 1971: Their airborne clock experiment demonstrated the slowing of time for a traveling clock. Initially, this seemed to support lsc theory because the amount of slowing is predicted by lsc theory. But it was then pointed out that the nontraveling clock had the same motion relative to the traveling clock, so relative motion does not explain the observed slowing. Thus, this traveling clock experiment represented what became known as the Clocks or Twins Paradox of relativity theory (a theory that results in a va riety of paradoxes).

The H&K experiment is not a paradox for the QMV which shows why the traveling clock ages less**:** the clock has many different rv values while traveling, and it is an interesting logical consequence of the qm that the sum of the different (rv•travel time) increments for the traveling clock will always be less than the sum of the increments for the nontraveling clock. Thus, like the other paradoxes of lsc theory, the Twins Paradox is not a paradox for the QMV.

The impact of Masses on the Absolute Speeds of Light and on Gravity in the QMV

Certainly, the significant gradients of gravity around all large masses effect the systems of m-e in the gradients. As might be expected, due to the fundamental differences between a theory based on measured lsc, and a theory based a qm, the two theories have fundamentally different reasons for the causes of all observed phenomena related to the speed of light and/or gravity. The reasons for the constant, measured speed of light (lsc) and for the cause of gravity are fundamentally different in the two theories, as logic would suggest.

In the QMV, when length, ℓ, is in Light-Second (LS) units (meaning the distance that light travels unimpeded through the qm in one absolute second, sa, according to an atomic clock at rest in the qm) the following equation specifies the "gravitational impact ratio", rg, due to a large mass m (in kg) on a m-e system ℓ LS away from m. And when ℓ is in LS units, Newton's gravitational constant becomes, G = 2.47e−36, (which is 6.67e−11÷ $\mathbf{c^3}$) and rg is**:**

$$rg = 1 / (1+m{\cdot}G/\ell)$$

In the QMV, the rg equation describes how gravity gradients slow round-trip energy exchange through the qm. While this slowing may influence light propagation, the exact relationship between rg and the speed of light in gravitational fields is not yet fully understood. Exploring this could clarify how massive systems self-reduce and release hidden energy.

Evidence re the QMV rg equation and the QMV modified Newton $g=m{\cdot}G/\ell^2$ equation

In the QMV, the Pound and Rebka, 1959 experiment showed that Earth's gradient of gravity slowed the photons' downward speed during their 22.5 meters of travel between their emission and absorption (and were therefore Doppler redshifted at the absorber) and that this required the absorber to be moving upward to create a necessary blueshift to permit the photons to be absorbed.

The downward slowing of the photons during the 22.5 meter distance is specified by the rg equation. It sheds important new light on a variety of phenomena including the enormous hidden energy in neutron stars, the anomalous rotations of spiral galaxies and the physical causes of the measured constant speed of light (that show why the observed constant lsc is an illusion caused only by the logical consequences of the qm).

Why masses of m-e slow the speed of energy transfer through the qm is currently unknown. Perhaps it is as simple as changing the permeability or permittivity of the qm. For now, we will assume that this is the physical cause.

Gravity and the Rationale for Modification of Mass Estimates

The previous section introduced the QMV rationale for the gravitational slowing of the speed of light, cag, that results in the slowing of the evolution of all m-e systems in a gravitational field or in a gradient of gravity. The rationale is that a mass-energy system in a strong gravitational field has a reduced rate of round-trip (RT) energy exchange in the quantum medium. This slowing alters the rates of clocks and the evolution of all m-e systems, resulting in an actual decrease in a system's mass. To quantify this, the QMV has the rg gravity correction factor:

$$g_{qmv} = (m{\cdot}G/\,\ell^2\,) \cdot rg$$

This modification of Newton's equation reflects the observed self-reduction of all m-e due to its influence in the qm. This view implies that the use of Newton's equation for calculating mass from orbital motion may lead to overestimates of mass, since it assumes unchanging energy exchange rates.

The QMV corrects this overestimation of gravity via the rg ratio that depends on m and ℓ.
To illustrate this in the table below, standard Newtonian mass estimates are compared with modified QMV-corrected estimates for various massive bodies:

Massive body	radius (LS)	surface g (LS/s/s)	Newton mass (kg)	rg estimate	corrected mass (kg)
Earth	0.02125	9.8/c=3.27e−8	5.97e24	~ 0.98	~ 5.85e24
Sun	2.322	2.74	1.99e30	~ 0.85	~ 1.69e30
white dwarf	~ 0.02335	~ 1.0e6	~ 1.00e30	~ 0.15	~ 1.50e29
neutron star	~ 3.34e−5	~ 1.0e12	~ 3.00e30	~ 0.02	~ 6.00e28

These are approximate values to show the scale of correction. The key idea is that gravitational slowing, represented by rg, leads to lower effective mass-energy content as observed from outside the gradient. This self-reduction effect grows with increasing gravity strength — consistent with observed limits on neutron star masses and anomalies in white dwarf dynamics.

This model supports the idea that the QMV offers a new, and deeper explanation for the nature of gravity — not as a force between masses in empty space, but as a byproduct of localized energy exchange reduction in the quantum medium.

<u>Observed Energy Supports QMV Mass Self-Reduction</u>
Remarkably, the QMV's prediction of extreme mass reduction in neutron stars finds support in astronomical observations. Magnetars—high-rg neutron stars—have unleashed giant flares that emit, in less than a second, as much energy as the Sun radiates in tens of thousands of years. Orthodox physics struggles to explain this energy scale from a ~1.4 solar-mass object. But in the QMV, this energy is not anomalous: it is the release of latent mass-energy previously hidden by the rg gravitational slowing of energy exchanging through the quantum medium. Rather than a red flag, this enormous hidden energy supports a radical idea**:** that high-rg objects like neutron stars appear less massive because they have lost nearly half of all their original mass-energy via mass self-reduction*, until they explode*.

<u>Light Bending and Precession</u>: The QMV agrees with the observed slowing and bending of light (near the sun and the precessions of planet orbits around our sun, but with a different causal explanation: gradients of gravity in the qm, not curved space-time.

<u>QMV provides a complete and self-consistent explanation for measured lsc:</u> This virtual lsc phenomenon is the result of the following three **logical consequences** of the qm and the **absolute velocities, va,** of m-e systems through this qm**: 1.** The va dependent anisotropic slowing of all RT energy exchanges and clock rates, **2.** The foreshortening of the systems to maintain isotropic RT energy exchanges and **3**. The asynchronization of the system's clocks to maintain virtual clock synchronization. This causes measured, constant light speed, c. (see www.qmview.net/lscv17**.**pdf)

<u>Conclusion</u>: The QMV is a theory of logical physical causes that explain a wide range of observed phenomena. Currently, some of these phenomena are explained by the mathematical space-time theory based on an inexplicable lsc axiom. It predicts paradoxical phenomena and is inconsistent with classical physics that has been logical and dependable for many centuries. The QMV explains the physical causes of the paradoxes and is consistent with classical physics. Thus, the QMV is a major simplification of physics theory. It offers a new era in physics theory if it continues to explain the physical causes of observed phenomena. The Cc clock experiment is a good way to help determine if the QMV correctly represents nature (*and can determine vSa*).