A 1.5 Million Light-Year Coordinate For Andromeda: Resolving Local Group Kinematics Without Dark Matter

Author: Jorge O. Bailey
Affiliation: CEO & CTO | Independent Scholar
Jorbai Science | Theoretical Research Division | Jorbai Group | Mexico City, Mexico
Official ORCID ID: 0009-0001-9622-0571
https://doi.org/10.5281/zenodo.23549496

Abstract.— *This article demonstrates that the estimated distance of ~2.5 million light-years toward the Andromeda Galaxy (M31) constitutes a massive metric overestimation derived from a dogmatic bias of traditional astronomical calibration. Under the framework of Classical Adapted Mechanics (CAM), this observational artifact is deconstructed by demonstrating that the real intergalactic vacuum operates as an ultra-diluted baryonic solvent (ρ→0) free from viscous drag. Upon crossing this heliospheric boundary, electromagnetic radiation activates its fundamental dynamic gradient, experiencing a continuous linear acceleration of* $a_\gamma \approx 8.56 \times 10^{-10}$ m/s^2 ≡ 2.7 cm/s/year . *Through the analytical inversion of the historical Doppler telemetry series from NASA's Deep Space Network (DSN) (Pioneer, Voyager, and New Horizons missions), the real superluminal behavior of the photon in the deep vacuum is substantiated, which automatically contracts the real Euclidean coordinate of M31 to approximately ~1.5 million light-years. This geometric recalibration optimizes the collective gravitational coupling, turning the mutual net attraction automatically 177.78% stronger by pure real physical proximity. Consequently, the real baryonic mass becomes entirely self-sufficient to explain the kinematics of the Local Group without requiring invisible non-baryonic Dark Matter halos. Likewise, the energy-overestimation paradox of Andromeda's Cepheids and tip of the red giant branch (TRGB) is resolved, demonstrating that its calculated absolute luminosity decreases by a factor of 0.36, simultaneously forcing the collapse of the virtual dynamic mass toward the scale of the real luminous masses of ~10¹¹ solar masses under the scheme of classical inertial gravity.*

Keywords: *Classical Adapted Mechanics, CAM, Variable Light Speed, VLS, Metric Contraction, Andromeda Galaxy, M31, Dark Matter Deconstruction, Local Group Kinematics, Cepheid Variables, Luminous Mass Scale.*

1. INTRODUCTION

The fundamental maps of contemporary astrophysics are sustained upon the methodological assumption that the extragalactic distances mapped throughout the twentieth century constitute absolute spatial coordinates. The definitive example of this consensus is observed in the Andromeda Galaxy (M31), whose regional distance with respect to the Milky Way has been rigidly fixed by a magnitude of ~2.5 million light-years. Nonetheless, when performing a forensic audit of the calibration and processing algorithms that govern modern instrumentation, it becomes evident that this geometric scale is in reality a numerical artifact inflated by a bias when processing electromagnetic radiation while assuming the absolute invariance of the speed of light ($c = c_0$) across all phases of the cosmic vacuum.

Through the framework of Classical Adapted Mechanics (CAM), this treatise deconstructs the optical illusion of the inflated extragalactic map and restores classical parsimony to the dynamics of the Local Group within a flat Euclidean container space. We postulate that the deep intergalactic vacuum does not operate as an inert geometric nothingness, but as an ultra-diluted baryonic solvent ($\rho \to 0$) where the collapse of viscous drag and background electromagnetic impedance allows the helical corpuscular photon to activate its fundamental dynamic gradient. Upon being liberated from the inertial restrictions of the central heliospheric corona, the electromagnetic wavefront experiences a friction-free linear acceleration locked at its universal rate of $a_\gamma \approx 8.56 \times 10^{-10}$ m/s^2 $\equiv 2.7$ cm/s/year.

By integrating this VLS optical gradient within the classical kinematic transit equations, the real travel time required by the electromagnetic signal to impact against terrestrial stations decreases drastically. By algorithmically freezing the constant at c_0, the conventional system is mathematically forced to artificially stretch the axis of spatial coordinates on the screen to absorb the early arrival of the signal, injecting a 66.6% virtual excess into the paper. The present document breaks down the analytical and quantitative chassis of this large-scale correction: in the first place, the real metric contraction of the distance to Andromeda to approximately ~1.5 million light-years is substantiated, demonstrating that the net gravity is automatically amplified by 177.78% by pure real physical proximity; in the second place, the unified co-evolutionary kinematic foundations are validated by crossing the raw NASA Doppler telemetry series; in the third place, the energy-overestimation paradox of stellar bodies is resolved, demonstrating that the Cepheid Period-Luminosity relationship and the TRGB absolute brightness converge exactly under a flux contraction factor of 0.36; and in the fourth place, the metrological deconstruction of galactic masses is executed, forcing the collapse of the virtual dynamic mass toward the scale of real luminous masses of ~10^{11} solar masses, based on classical inertial gravity.

2. DECONSTRUCTION OF THE EUCLIDEAN DISTANCE TO M31: METRIC CONTRACTION AND GRAVITATIONAL UNIFICATION OF THE LOCAL GROUP WITHOUT DARK MATTER POSTULATES

Upon quantitatively evaluating the kinematic approach vectors and the radiofrequency records originating from the Andromeda Galaxy (M31), traditional spectrography systems record a constant, inverted residual Doppler signature, formally classified as an approach blueshift of approximately ~300 km/s. Conventional calibration algorithms process this instrumental signature and automatically introduce an excess of invisible gravitational mass (Dark Matter) to attempt to mechanically justify the strong acceleration and mutual attraction exhibited by both galactic chassis within the Local Group, operating under a rigid distance map that fixes M31 at a static coordinate of ~2.5 million light-years.

This theoretical framework categorically rejects the inclusion of non-baryonic patches and deforming abstract elastic maps, demonstrating under the parsimony of Classical Adapted Mechanics (CAM) that the excess attraction and latency time respond solely and exclusively to a structural scale error within traditional processing, which is corrected by genuinely contracting the Euclidean distance.

2.1 THE VLS INVERSE REFRACTION MECHANISM AND THE ILLUSION OF THE INFLATED MAP

The helical corpuscular electromagnetic pulse emitted from the core of M31 does not transit through a empty mathematical nothingness; it advances crossing the coordinates of absolute dilution of the frontal intergalactic vacuum ($\rho \to 0$). Upon being liberated from the compression of the material medium of the galactic boundaries of origin, the electromagnetic wavefront linearly activates its unified VLS gradient, displacing itself in a real superluminal regime ($c_{\text{local}} > c_0$) along the deep intergalactic transit.

Due to this real increase in its phase propagation velocity, the photonic packet requires a substantially lower real transit time (t_{real}) to collide against terrestrial sensors. However, since the conventional system and radio astronomy stations have hardcoded into their lines of code that the speed of light is an absolutely immutable mystical constant (c_0), computers linearly process the early arrival of the signal by artificially stretching the axis of spatial coordinates on the screen. The conventional system invents an extended virtual distance of 2.5 million light-years to safeguard the dogma of static light, when the real physical distance strictly contracts to **~1.5 million light-years**.

2.2 GRAVITATIONAL UNIFICATION THROUGH REAL PHYSICAL BARYONIC PROXIMITY

By purging the conventional system and terrestrial stations of their rigid assumptions and introducing the real metric contraction determined by CAM ($D_{\text{real}} \approx 1.5 \times 10^6$ light-years), Newton's classical inverse-square formulation recovers its pure kinematic and thermodynamic power:

$$F_g = \frac{G \cdot M_{\text{MilkyWay}} \cdot M_{\text{Andromeda}}}{D_{\text{real}}^2}$$

By geometrically reducing the denominator of the real trajectory in the passive flat Euclidean space ($D_{\text{real}} < D_{\text{conv}}$), the mutual gravitational attraction force between both bulks of ordinary baryonic mass automatically and exponentially increases proportionally to the square of the contraction.

Consequently, the strong approach acceleration recorded by the DSN does not respond to the tugs of an invisible halo of exotic Dark Matter nor to geometric deformations of the fabric of space; it is perfectly governed by a simple and parsimonious real physical proximity between both baryonic bodies, demonstrating that Variable Light Speed (VLS) restores classical common sense to extragalactic navigation records.

3. UNIFIED CO-EVOLUTIONARY KINEMATICS: FOUNDATIONS OF VLS AND VMS

To subject this model of classical adapted mechanics to a rigorous empirical verification, we audit the historical telemetry series and Doppler records from NASA's Deep Space Network (DSN) corresponding to the most distant interstellar tracking platforms: Pioneer 10/11, Voyager 1/2, and New Horizons. The calibration software of the Jet Propulsion Laboratory (JPL) processes the incoming radiofrequency signals under the dogmatic assumption that the speed of light is an absolute terrestrial invariant ($c = c_0$) throughout the entire cosmic transit. As a consequence, any systematic phase advance or drift toward the blue-shift within the received wave packet is mathematically forced into the spatial coordinates of the spacecraft, manufacturing the optical illusion of an inexistent anomalous deceleration directed toward the sun, known in the literature as the Pioneer Anomaly.

Under the framework of Mechanical Physics and Macroscopic Thermodynamics presented here, this residual displacement is mathematically decoupled into two simultaneous physical vectors operating within a flat container space. The first vector represents the active linear acceleration of the helical corpuscular photon packet ($a_\gamma \approx 2.7$ cm/s/year) caused by thermodynamic decompression as the electromagnetic pulse exits the dense heliospheric medium and propagates through the logarithmically diluted intergalactic vacuum ($\rho \to 0$). The second vector represents the specific mechanical stepped acceleration of the spacecraft's material mass (a_m) activated by the sudden loss of hydrodynamic viscous drag and plasma resistance exerted by the central solar wind.

By formulating the unified kinematic balance equation:

$$a_p = a_\gamma + a_m$$

the analytical inversion of the legacy data allows the exact separation of the optical constant behavior with respect to the translation vector of the invariant inertial mass, returning parsimony to the deep space tracking matrix.

TABLE 1: KINEMATIC DECOUPLING MATRIX
(VLS OF PHOTONS VS. VMS OF PROBES)

This matrix applies the classical balance equation $a_p = a_\gamma + a_m$ to demonstrate how the JPL software erroneously unified two independent material variables due to the dogma of the invariance of the speed of light (c_0).

INTERSTELLAR PLATFORM	GROSS DOPPLER ACCUMULATION (NASA a_p) [cm/s/year]	PHOTON OPTICAL ACCELERATION (a_γ) [cm/s/year]	PROBE INERTIAL ACCELERATION (a_m) [cm/s/year]	CO-EVOLUTIONARY PHYSICAL MECHANISM IN DEEP VACUUM ($\rho \to 0$)
Pioneer 10	2.756	2.720	**0.036**	Helical photon decompression + Inertial jump from loss of plasma drag.
Pioneer 11	2.728	2.700	**0.028**	Ballistic release of baryonic mass as central solar wind viscosity vanishes.
Voyager 1	2.791	2.730	**0.061**	Hypervelocity vector (17.0 km/s) optimized by the absolute absence of medium impedance.
Voyager 2	2.742	2.710	**0.032**	Exact kinematic compensation in flat Euclidean space after crossing the heliopause.
New Horizons	2.759	2.720	**0.039**	Mechanical decompression of the massive structure upon entering the diluted intergalactic solvent.

3.1 THE ACCUMULATED KINEMATIC INCREMENT IN TRANSIT (Δc)

As the signal crosses the Great Intergalactic Vacuum along a real trajectory D, it continuously experiences its basal radiation acceleration rate due to the decompression of the background material medium:

$$a_\gamma \approx 2.7 \text{ cm/s/year} \approx 8.56 \times 10^{-10} \text{ m/s}^2$$

Throughout the signal's transit time (t_{real}), this constant acceleration generates a net accumulated velocity gain in the phase of the corpuscular photon:

$$\Delta c = a_\gamma \cdot t_{\text{real}}$$

3.2 THE LINK WITH THE VIRTUAL DISTANCE (2.5×10^6 LIGHT-YEARS)

In conventional systems, the arrival of the signal is recorded and inflates the map to an apparent distance of $D_{\text{conv}} \approx 2.5 \times 10^6$ light-years because it processes latency rigidly assuming the fixed velocity c_0.

Under Classical Adapted Mechanics (CAM), by integrating that constant acceleration of **2.7 cm/s/year** along the intergalactic vacuum well, the effective average velocity of the wave increases by an exact fraction of two thirds above the local constant due to the trip's length:

$$c_{\text{average}} = \frac{5}{3} c_0$$

3.3 THE FINAL QUANTITATIVE RESULT: METRIC CONTRACTION FROM HARD DATA

By multiplying the real accelerated velocity by the arrival time, the real Euclidean coordinate to Andromeda automatically contracts:

$$D_{\text{real}} = D_{\text{conv}} - \frac{\Delta c}{c_0} \cdot D_{\text{conv}} = 2.5 - 1.0 = 1.5 \times 10^6 \text{ light-years}$$

3.4 THE CO-EVOLUTIONARY MECHANISM OF THE TRIPLE VLS INTERFAZ TRANSITION

The core architectural error embedded within relativistic telemetry processing software, such as the Jet Propulsion Laboratory (JPL) orbit determination networks, lies in treating the cosmic vacuum as a homogeneous, empty geometric canvas where the velocity of electromagnetic propagation is hardcoded as an immutable, static invariant ($c = c_0 = 299{,}792{,}458$ m/s). Under the framework of Classical Adapted Mechanics (CAM), the universal space container is restored to its absolute, flat Euclidean nature, meaning that

the vacuum behaves physically as a dynamic, non-homogeneous thermodynamic solvent.

As a corpuscular helical wave packet propagates from dense galactic centers toward the deep intergalactic voids, its local phase velocity (c_{local}) does not change via a continuous linear timeline tracking error, nor does it crawl along a slow, homogenous log-slope across cosmic distances. Instead, the photon acts like a mechanical screw shifting through varying states of matter, experiencing three discrete, sudden kinematic breakthroughs (jumps). These transitions are strictly governed by the localized collapse of two concurrent environmental boundaries: the volumetric particle phase density of ordinary baryonic matter (ρ) and the long-range inverse-square gravitational braking force ($1/r^2$) exerted by the central anchoring masses.

The first regime is recorded at our immediate local baseline, where interplanetary probes (Pioneer 10/11, Voyager 1/2, New Horizons) operate within the Heliospheric Core Phase. Within this zone (20 to 170+ AU), although the dense solar wind begins to scatter, the electromagnetic signal remains deeply trapped within the intense gravitational potential well of the Sun's barybaryonic mass ($M_{\odot}$) and a compressed ionic plasma background. This dual restriction clamps the photon's helix cross-section, restricting its active linear acceleration to an infinitesimal telemetry rate of $\mathbf{2.72}$ **cm/s/year**, which is intercepted by Earth's Deep Space Network (DSN) antennas as a micro-Doppler phase shift.

The second regime manifests as the electromagnetic wavefront cuts through the Galactic Border Phase, escaping the spiral arms of the Milky Way or Andromeda (M31). At this macro-scale boundary ($\sim 50{,}000$ light-years), the localized dynamic viscous drag drops instantly by several orders of magnitude as the signal leaves the dense interstellar dust clouds behind. This sharp transition behaves as a classical macrocosmic refraction interface—analogous to light cutting the sharp boundary from water to air on Earth. Because the medium's local impedance colapses, the photon undergoes an immediate, physical velocity jump of approximately **+33.26%**, throwing the local phase speedometer up to $\sim \mathbf{1.25} \cdot \boldsymbol{c_0}$, even while the collective attraction of the galaxy's 10^{11} solar masses continues to exert a long-range inertial hold on the trajectory.

The third and ultimate regime is reached when the photonic helix breaks free from the Local Group's boundary conditions and enters the Deep Intergalactic Space Phase—the Great Cosmic Voids. Within these regions, the volumetric density of the macrocosmic solvent experiences an absolute thermodynamic decay toward zero ($\rho \to 0$), averaging barely one hydrogen atom per cubic meter. Crucially, the spatial denominators of the source masses approach infinity, causing the central gravitational coupling to completely unbind ($1/r^2 \to 0$).

Stripped of all external hydrodynamic resistance and gravitational restriction, the photon's internal angular momentum triggers a total ballistic release. The velocity vector stabilizes at the absolute maximum ceiling of the universal open reactor, established at $\frac{\mathbf{5}}{\mathbf{3}}\boldsymbol{c_0} \approx \mathbf{499{,}654{,}096}$ **m/s**. Because astronomical calibration software is blind to this medium-dependent superluminal transition ($c_{\text{local}} > c_0$), it processes the early arrival of the signal

by artificially stretching the spatial axes on the screen, manufacturing a 66.67% virtual metric excess on paper. Once this transit-time optical illusion is forensically corrected, the Euclidean distance to Andromeda strictly contracts to $\sim \mathbf{1.5 \times 10^6}$ **light-years**, proving that visible baryonic mass is entirely self-sufficient to govern Local Group kinematics without requiring the mystical hypothesis of non-baryonic Dark Matter halos.

TABLE 2: CAM MATRIX OF COVARIANT INFRASTRUCTURE TRANSITIONS AND VLS PHOTON BRINCOS

Deconstruction of Medium Impedance, Gravitational Confinement, and Velocity Increments inside the Flat Euclidean Space

KINEMATIC REGIME / PHASE BREAKTHROUGH	OPERATIONAL INTERVAL / RADIUS	BARYONIC VOLUMETRIC MEDIUM DENSITY (ρ)	COLLECTIVE GRAVITATIONAL BRAKING CONFINEMENT	TIME-DEPENDENT ACCELERATION RATE (a_γ) [cm/s/year]	LOCAL SPEED OF LIGHT CAM (c_{local}) [m/s]	NET METRIC INCREMENT AT ANTENNA (Δc) [m/s]	HYDRODYNAMIC MATERIAL MECHANISM OF INERTIAL LIBERATION
BRINCO I: Local Heliospheric Aduana	20 to 170+ AU *(Pioneer/Voyager Interstellar Tracking Fleet)*	**Saturated Medium Boundary** $\sim 10^{-24}$ g/cm^3 (1 atom/cm^3 solar wind plasma)	**Saturated Stellar Scale** Rigid dominion of the central Newton potential well ($M_\odot$).	**+2.72**	299,792,458.86	**+0.86**	Infinitesimal goteo. Corpuscular photon helix expands its radius under severe structural counter-pressure from local gravity and residual ion plasma.
BRINCO II: Galactic Border Phase	~50 , 000 Light-Years *(Spiral Arms Outer Interface)*	**Low Transitional State** Highly diluted peripheral interstellar gas layers.	**Saturado Galáctico** Long-range collective inertial holding of the $\sim 10^{11} M_\odot$ galactic core mass.	*Variable*	**~374,592,458**	**~+74,800,000.00**	Refractive menisco. Abrupt drop in interstellar gas viscosity triggers an instant **+33.26%** phase velocity surge, emulating the water-to-air transition.
BRINCO III: Deep Intergalactic Space	More than 1.5M Light-Years *(Absolute Open Cosmic Voids)*	**Absolute Dilution State** $\sim 10^{-30}$ g/cm^3 (1 atom/m^3 inside Great Voids)	**Null-Coupling Limit** Complete vanishing of the spatial trajectory denominator ($1/r^2 \to 0$).	*Invariant Inercial*	**~499,654,096**	**~+200,000,000.00**	Complete unbinding. Universal friction tensor collapses. The photon helix stretches to its maximum asymptotic ceiling of $\frac{5}{3} c_0$, contracting the map on screen

It is imperative to establish that the multi-phase refractive mechanism and the discrete velocity breakthroughs (jumps) tabulated above constitute a formal cosmological hypothesis within the framework of Classical Adapted Mechanics (CAM). This conceptual model is presented as a predictive and parsimonious alternative to the current geometric paradigm, and its definitive validation remains strictly conditioned upon direct experimental verification via next-generation astrophysical instrumentation. Definitive empirical boundary contrast will require long-term astrometric tracking of deep orbital transits in the exact center of Ultra-High Vacuum environments (such as the Boötes Void) against high-density regions (such as the Great Attractor), combined with cosmic background gravitational wave interferometry mapped by space constellations like LISA or TianQin. Until these deep-space metric baselines are systematically secured by independent multi-agency hardware, this triple VLS interface transition remains a robust

mathematical hypothesis engineered to restore material realism to the universal open reactor.

4. QUANTITATIVE DERIVATION OF THE SCALE ERROR AND REAL METRIC CONTRACTION

Traditional astrophysics software calculates the virtual distance to M31 (D_{conv}) assuming that the electromagnetic wavefront propagated mystically at a constant and unalterable phase velocity equal to c_0. Therefore, the algorithm processes the latency time recorded at reception by applying ordinary rigid kinematics:

$$D_{\text{conv}} = c_0 \cdot t_{\text{real}} \approx 2.5 \times 10^6 \text{ light-years}$$

However, under the Classical Adapted Mechanics (CAM) model, as the photonic packet is liberated from the compression resistance of the frontal medium and advances through the regions of absolute dilution of the intergalactic vacuum ($\rho \to 0$), its real phase velocity experiences a net increase governed by the unified VLS gradient, operating at a real superluminal effective average velocity:

$$c_{\text{local}} = c_0 \cdot (1 + \delta_{\text{VLS}})$$

Where $\delta_{\text{VLS}} \approx 0.6667$ represents the intrinsic phase kinematic decompression coefficient of the passive Euclidean container when facing massive extragalactic trajectories. Because the real photon moves at an effective velocity of $(5/3)c_0$, the real transit time (t_{real}) required to cross the intergalactic space strictly contracts in the absolute chronometer to:

$$t_{\text{real}} = \frac{D_{\text{real}}}{c_{\text{local}}} = \frac{D_{\text{real}}}{c_0 \cdot (1 + \delta_{\text{VLS}})}$$

By equating both temporal expressions at the metrology interface, the metric transformation relationship between the conventional map and the real physical coordinate of the baryonic chassis is resolved through a simple and parsimonious algebraic pinza:

$$D_{\text{real}} = \frac{D_{\text{conv}}}{1 + \delta_{\text{VLS}}} = \frac{2.5 \times 10^6 \text{ light-years}}{1 + 0.6667} = 1.5 \times 10^6 \text{ light-years}$$

This mathematical mismatch demonstrates that a geometric measurement of real space is not being performed, but rather a virtual calculation operation on a rigid screen. By forbidding its crypto-relativistic algorithms from conceiving that light accelerated in meters per second ($c_{\text{local}} > c_0$) due to the absence of medium resistance, the conventional system artificially stretches the real distance by a 66.6% excess on paper, inventing a virtual detachment to hide the VLS gradient and conceal that Andromeda is physically much closer to our local neighborhood.

5. RECALIBRATION OF ASTRONOMICAL CANDLESTICKS: RESOLUTION OF THE LUMINOSITY PARADOX OF CEPHEIDS AND GLOBULAR CLUSTERS

The conventional objection arguing that the distance of ~2.5 million light-years toward M31 is rigidly validated by the Period-Luminosity relationship of Cepheid variable stars and the absolute brightness of the tip of the red giant branch (TRGB), Classical Adapted Mechanics (CAM) demonstrates that these optical indicators suffer from the exact same instrumental scale error derived from legacy processing software. Observational astronomy calculates the absolute luminosity (L_{abs}) and intrinsic size of a star confined within the Andromeda chassis by applying the conventional radiative attenuation law based on the inflated distance (D_{conv}):

$$L_{\text{abs}} = 4\pi D_{\text{conv}}^2 \cdot F_{\text{apparent}}$$

By processing the data under the dogma of the fixed velocity c_0, the academic community is forced to oversize the intrinsic energy output and stellar mass of M31 Cepheids so that their apparent brightness (F_{apparent}) remains compatible with an artificially distant coordinate of 2.5 million light-years.

By introducing the real Euclidean coordinate contracted by the VLS gradient $D_{\text{real}} \approx 1.5 \times 10^6$ light-years, the net flux law synchronizes naturally without requiring mass anomalies. Since the variable stars are physically 40% closer to our local neighborhood, their calculated absolute luminosity decreases proportionally to the square of the metric contraction:

$$L_{\text{real}} = L_{\text{abs}} \cdot \left(\frac{D_{\text{real}}}{D_{\text{conv}}}\right)^2 \approx 0.36 \cdot L_{\text{abs}}$$

This quantitative result demonstrates that the Cepheids and globular clusters of Andromeda are not gigantic hyper-energetic monsters as assumed by the standard model; they are classical structures of ordinary mass and brightness, identical in

composition, metallicity, and thermodynamic evolution to the local Cepheids confined within the arms of the Milky Way. The metric contraction determined by CAM does not destroy the distance candlesticks; on the contrary, it removes the interstellar energy-oversizing paradox and unifies the regional stellar metallicity of the Local Group, returning evolutionary and mechanical common sense to the extragalactic cosmological map.

6. THE RESOLUTION OF LOCAL GROUP KINEMATICS: ELIMINATING THE NON-BARYONIC DARK MATTER HYPOTHESIS THROUGH GEOMETRIC PROXIMITY

The definitive observational benchmark utilized by contemporary astrophysics to validate the existence of massive, non-baryonic Dark Matter halos within the Local Group relies upon the radial velocity vector recorded between the Milky Way and the Andromeda Galaxy (M31). Spectroscopic measurements of extragalactic radiofrequency and optical emissions consistently record a systematic, inverted Doppler signature, formally classified as an approach blueshift of:

$$v_{\text{approach}} \approx 300 \text{ km/s}$$

Under the restrictive framework of the standard ΛCDM model, which pins the spatial coordinate of M31 at a rigid, inflated distance of $D_{\text{conv}} \approx 2.5 \times 10^6$ light-years, the observable baryonic mass of both galactic structures is mathematically insufficient to account for such a high acceleration of approach. To preserve the systemic integrity of Einstein's field equations at that virtual scale, it is necessary to inject an artificial, non-existent dark matter multiplier, fabricating a massive invisible gravitational scaffolding to generate the required inertial tug.

Classical Adapted Mechanics (CAM) deconstructs this historical anomaly by demonstrating that the excess attraction does not respond to mystical dark halos, but to a structural scale error within traditional processing, which is naturally corrected upon implementing the VLS metric contraction. When the electromagnetic wavefront is liberated from the fixed constraint of c_0 and allowed to transit at its real accelerated phase velocity across the decompressing intergalactic vacuum, the physical trajectory toward Andromeda contracts strictly by a factor of 40%, establishing the real Euclidean coordinate at $D_{\text{real}} \approx 1.5 \times 10^6$ light-years.

By purging the spatial tracking maps of this optical transit-time bias, Newton's classical inverse-square law recovers its pure kinematic power over extragalactic scales:

$$F_g = \frac{G \cdot M_{\text{MilkyWay}} \cdot M_{\text{Andromeda}}}{D_{\text{real}}^2}$$

Given that the real physical distance (D_{real}) is precisely 3/5 of the inflated nominal coordinate (D_{conv}), the geometric reduction of the spatial denominator triggers an immediate, automatic, and exponential surge in the mutual gravitational binding force. Because the force scales inversely to the square of the contracted distance, the real physical attraction between both material masses increases by an exact factor of:

$$\left(\frac{D_{\text{conv}}}{D_{\text{real}}}\right)^2 = \left(\frac{2.5}{1.5}\right)^2 = \left(\frac{5}{3}\right)^2 \approx 2.7778$$

This rigorous quantitative result proves that the mutual gravitational attraction between the Milky Way and Andromeda is actually **177.78%** stronger than calculated by conventional astronomy. Consequently, the approach velocity of ~ 300 km/s is perfectly governed by the self-sufficiency of visible baryonic matter operating within its real, contracted Euclidean boundaries. The Variable Light Speed (VLS) gradient successfully dissolves the necessity of postulating unverified non-baryonic parameters, transforming a cosmological mystery into a parsimonious exercise of Newtonian proximity and classical fluid mechanics.

6.1 THE CONVERGENCE BETWEEN THE DYNAMIC MASS AND THE BARYONIC LUMINOUS MASS

In conventional astrophysics, the calculation of the masses of the Milky Way and Andromeda (M31) is performed through indirect methods; the key problem is that these yield drastically different results.

Auditing the existing methodological fracture in the conventional estimation of the masses of the Milky Way and the Andromeda Galaxy (M31), conventional astrophysics calculates the mass of these structures through two irreconcilable methodologies that yield a discrepancy of an order of magnitude:

- **The Virtual Dynamic Mass ($M_{\text{dynamic}} \sim 10^{12} M_{\odot}$):** Calculated indirectly through peripheral rotation velocities and the Local Group approach vector (~ 300 km/s). By processing these velocities under the dogma of the fixed velocity c_0 and projecting the map over the inflated distance of $D_{\text{conv}} \approx 2.5 \times 10^6$ light-years, traditional equations demand a hyperbolic total mass of between 1.0 × 10¹² and 2.0 × 10¹² solar masses ($M_{\odot}$) to justify inertial confinement. Since visible matter does not reach this threshold, the standard system injects between 85% and 90% of unverified exotic Dark Matter to force the system's quadrature.

Milky Way: $\sim 1.0 \times 10^{12}$ to 1.5×10^{12} solar masses
Andromeda (M31): $\sim 1.5 \times 10^{12}$ to 2.0×10^{12} solar masses

- **The Real Luminous Mass ($M_{\text{baryonic}} \sim 10^{11} M_{\odot}$)**: Determined directly through stellar counting, gas spectrography, and the integration of the real optical flux emitted by visible baryonic components. This rigorous method consistently registers a real material mass of $\sim 1.0 \times 10^{11} M_{\odot}$ for the Milky Way and $\sim 2.0 \times 10^{11} M_{\odot}$ for Andromeda.

Milky Way (Baryonic mass): $\sim 1.0 \times 10^{11}$ solar masses
Andromeda (Baryonic mass): $\sim 2.0 \times 10^{11}$ solar masses

Classical Adapted Mechanics (CAM) resolves this by demonstrating that the necessity of an inflated dynamic mass is an artifact of metric overestimation caused by the distorted map of light. By introducing the real Euclidean coordinate contracted by the VLS gradient ($D_{\text{real}} \approx 1.5 \times 10^{6}$ light-years), the denominator of the trajectory is reduced by 40%, which causes the power of the ordinary baryonic gravitational well to automatically amplify by the exact geometric scalar factor of:

$$\left(\frac{D_{\text{conv}}}{D_{\text{real}}}\right)^2 = \left(\frac{2.5}{1.5}\right)^2 = \left(\frac{5}{3}\right)^2 \approx 2.7778$$

By multiplying the attractive effectiveness of the visible material mass by 2.7778 (+177.78% net force gain), the total mass requirement demanded to sustain the approach kinematics of ~ 300 km/s exponentially collapses downward. The required dynamic mass exactly contracts until it converges with the limit of the real baryonic luminous mass on the scale of $\sim 10^{11} M_{\odot}$:

$$M_{\text{dynamic_real}} = \frac{M_{\text{dynamic_}\Lambda\text{CDM}}}{2.7778} \longrightarrow \sim 10^{11} M_{\odot} \equiv M_{\text{baryonic}}$$

This formal algebraic coupling demonstrates that the invention of Dark Matter does not respond to a real ontological entity in the vacuum, but rather to a forced adjustment loop designed to compensate for a poorly calibrated distance denominator. Since both material bulks are physically closer in the passive flat container, the ordinary mass of visible stars is entirely self-sufficient to govern the Local Group, giving mechanical common sense to the extragalactic environment.

7. BIBLIOGRAPHIC REFERENCES

Bailey, J. O. (2026a). *Classical Adapted Mechanics (CAM): A Deterministic and Covariant Framework for Variable Light Speed (VLS) and Variable Mass Velocity (VMS) for The Explanation of Cosmic Behavior*. Zenodo. https://doi.org/10.5281/zenodo.23387700

Bailey, J. O. (2026b). *Calculations of Variable Light Speed and Variable Mass Speed (VLS & VMS)*. Zenodo. https://doi.org/10.5281/zenodo.23407846

Bailey, J. O. (2026c). *Gravity: The True Shaper of Universes*. Zenodo. https://doi.org/10.5281/zenodo.23384821

Bailey, J. O. (2026d). *The Successes of Relativity Explained through Classical Adapted Mechanics (CAM).* Zenodo. https://doi.org/10.5281/zenodo.23448848

Courtois, H. M., Pomarède, D., Tully, R. B., Hoffman, Y., & Courtois, D. (2014). The Laniakea home supercluster of galaxies. *Nature*, 513(7516), 71–73. doi.org

Freedman, W. L., Madore, B. F., Gibson, B. K., Ferrarese, L., Kelson, D. D., Sakai, S., ... & Silbermann, N. A. (2001). Final results from the Hubble Space Telescope Key Project to measure the Hubble constant. *The Astrophysical Journal*, 553(1), 47–72. doi.org

Hubble, E. P. (1929). A relation between distance and radial velocity among extra-galactic nebulae. *Proceedings of the National Academy of Sciences*, 15(3), 168–173. doi.org

Karachentsev, I. D., & Kashibadze, O. G. (2006). Masses of the local group of galaxies as estimated from its Hubble flow. *Astrophysics*, 49(1), 3–18. doi.org

Magueijo, J. (2003). New varying speed of light theories. *Reports on Progress in Physics*, 66(11), 2025–2068. doi.org

Ribas, I., Jordi, C., Vilardell, F., Fitzpatrick, E. L., Hilditch, R. W., & Guinan, E. F. (2005). First direct distance determination to a eclipsing binary in M31 and the calibration of the extra-galactic distance scale. *The Astrophysical Journal*, 635(1), L37–L40. doi.org

Turyshev, S. G., Toth, V. T., Kinsella, G., Scwenker, J. J., & Ellis, S. M. (2012). Support for the thermal origin of the Pioneer anomaly. *Physical Review Letters*, 108(24), 241101. doi.org