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Three-Body Logging for Data Management

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Abstract

The research develops a logging method in observational astronomy from a nuclear science perspective. It takes the existing optics based observational parameters to a three-body parameter in the observational vantage points. By taking the earth's atmosphere as a positive meniscus lens, the celestial plane and the sun-earth-moon three-body plane are differentiated in dimensions. The complex planes are differentiated between observational preconditions and data depth in light quanta, and the light quanta in data structure can be further corrected to motion biases and gravitational lensing. The article proposes a quantum computing solution to data management with possible future extensions in informatics automation in orbital designs.

Keywords: Complex Plane; Cosmic Florescence; Data Management; Multi-Wavelength; N-Body Problem; Observation Log.

1. Introduction

Modern astronomy is deeply rooted in electronic engineering and being developed in digital engineering. Digitization and data science have replaced the mathematical labors in traditional astronomical methods, however, the complexities in Big Data and physical interpretations have posed new challenges [1, 2].

The challenges in Big Data are intimately associated with automation for informatics systems, and knowledge and science management. Big Data management is essentially optimization on parametric systemic calculations. Quantum computers use superposition pairing to optimize binary calculations, but the base design's compromise with logarithmic calculations is the most important concerning Shannon entropy [3-5].

With RLC circuit, there is a possibility to construct a computational Riemann Sphere for base system with quantum computers, seen in Figure 1. The possibilities make a CPU basis to compute two-dimension numbers with a one-dimension I/O. The alternative approach to utilize computation power is ensured by the proof for Fermat's Last Theorem [6]. The conservative strategy makes it possible to compute complex topological data across servers with a main bus control design — for legitimate purposes in science in general, and in astronomy and cosmology in particular, and the research that led to the design corresponds with the Digital Twin workflow conceptualized by [7].

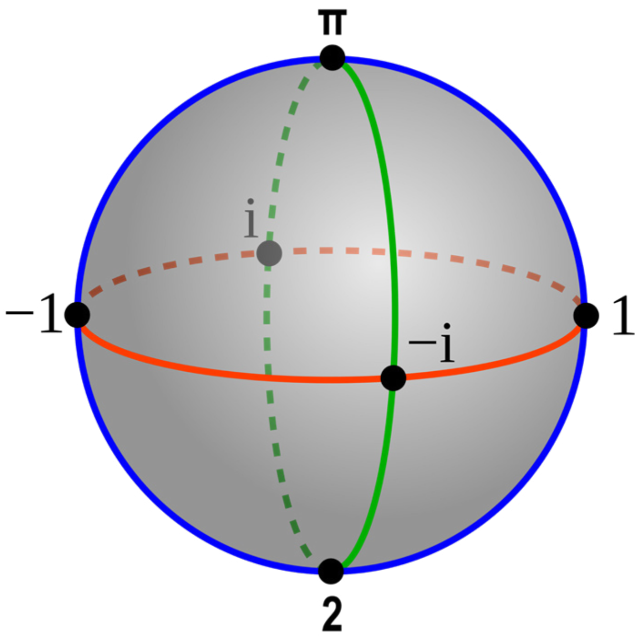

Figure 1: Quantum-computing Reimann Sphere concept, remixed from GKFX and de: User: Bjoern_klipp's work on Wi-

kimedia Commons.

1.1. Application Prospective

Astronomical observation logs have been based on the visual wavelength. The morphological classification scheme was put forth by [8]. before the initiation of the nuclear sciences, which have been widely adapted in astronomy. Reliance on the optical bands can be convenient for human perceptions, but it can also complicate the mathematical calculations and data management with the involvement of sophisticated instrumentation in the cosmic environment. As the morphological classification scheme is descriptive of the optical light quanta distribution, the application is mainly considered for developing a logging method that can be descriptive of the spatial distribution of light quanta in the cosmic environment.

The application is purposed to simplify the process of correction to morphological distortions with sensor technology observations. Relativistic principles have enabled observational capacities for multi-wavelength surveys and analyses [9]. Local radiative transfer processes can be wildly distorted in observations due to wavelength shifts and amplification by spatial coverage. With the observational standpoint of human civilization, the earth, sun, and moon are taken as the basic three-body system for the realistic basis from engineering. The preconception has been applied to and exemplified by the ground-based observations from Micro Observatory, and extendable to orbital surveys [10]. More precise logging method development in astronomy and cosmology will depend on instrumentation sensitivities and data feedback. Its potentials have been seen in 4D printing developments for material sensing and remote material interactions [11].

With the application orientation, the research is dissected into two parts. The main article is on the prospect application in cosmology, observational cosmology, and observational astronomy. The engineering concept is rooted in the N-body problem for the dualities engineering solutions created in motions between the earth-moon-sun 3-body and the target celestial objects in the data sphere. The mathematical proof for the concept constitutes the second part. Elliptical galaxies are the most abundant galaxies in the cosmos, and by the proof of Fermat's Last Theorem, a three-dimension coordinate plane can be bijective to a one-dimension number line. The mathematical concept can enable automation and quantum calculation with its current limitations in logarithmic calculations [3]. Therefore, the article serves for the cosmological and astronomical applications in nuclear cosmology for current astronomical big data management from the previous multi-wavelength data processing and observational astronomy [10].

With the computer science perspective, even though the possibilities seem to limit the quantum qubits' potentials in parallel processing with eigenvectors, its calculation power is theoretically unlimited with two-dimension real number coordinates, given a set of surjective function with isomorphism between the two axes in Riemann Sphere. The one-dimension I/O becomes the eigenvalues for a whole three-dimension coordinate plane. The difficulties would be to calculate e, i, π and correspond to basic transcendental numbers with the single thread task remained from the qubits, or else it will only have the capacities in calculating natural numbers. It is conjectured that by exchanging 0 and ∞ to |2| and |π| in Riemann Sphere for third dimension processing, leaving the concept from 0 to ∞ to the I/O, the task can be possibly achieved.

2. Methods

2.1. Astronomical Concept

The method converts the observational time parameters to the sun and moon angles [13, 14]. With ground-based telescopes, for example, a 60-second exposure covers a prograde arc trajectory of 17,987,547,480 meters of light quanta, and the two-dimensional image depth will need retrograde corrections to cover a semi-trapezoidal area of light quanta, regardless of the cosmic rays' origins captured in the well. This implies that, in order to simulate the data structure, or further utilize quantum information captured in data, the three-body relations relative to the observed source(s) need to have a gravitational field adjustment. I have reorganized the white hole observation experiment in Table 1 [10]:

Table 1: Cross-correlation FITS Details.

Solar Angle	Equation of Time	Adjusted ⍰ Angle	Moon Longitude	RA	DEC	Altitude	Azimuth
-144.90°	0.27°	-144.63°	244.05°	15.11°	-71.97°	47.269°	172.586°
-65.63°	0.23°	-65.4°	-116.56°	204.53°	-29.97°	14.251°	116.647°
-133.61°	0.23°	-133.38°	-115.98°	45.00°	-30.00°	89.359°	285.209°
-131.50°	0.16°	-131.33°	-130.55°	187.97°	12.28°	59.882°	182.579°
-117.60°	0.16°	-117.43°	-132.52°	195.00°	40.00°	84.428°	246.960°
-106.71°	0.09°	-106.62°	-131.61°	216.46°	-11.11°	70.938°	359.893°
-73.64°	0.09°	-73.55°	-215.56°	210.00°	30.00°	88.301°	171.282°

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-7.27°	0.09°	-7.17°	143.84°	270.89°	-23.03°	35.041°	186.113°
-7.27°	0.09°	-7.18°	143.85°	270.89°	-23.03°	34.995°	186.655°
-6.91°	0.09°	-6.81°	143.85°	270.89°	-23.03°	34.949°	187.159°
61.96°	0.11°	62.07°	228.06°	43.87°	349.67°	62.864°	157.884°
90.37°	0.21°	90.58°	-130.25°	173.67°	2.73°	46.455°	209.966°

Note. — Observations from Aug. 4, 2021 are excluded. Figures are preserved to the second decimal place. Solar angles are calculated by Universal Time. Equation of time is obtained through observation date and corrects solar angle [15]. Moon longitude is calculated from Local Mean Sidereal Time minus Greenwich Mean Sidereal Time for the earth-moon barycenter functions [16]. Radius of curvature of the atmospheric positive meniscus lens in observations can be derived from right ascension (RA), declination (DEC), and geographic location, with atmospheric parameters depending on the fluorescence spectroscopy. With the magnification, the real image's arc distance in the florescent celestial sphere area as to the three-body gravitational-lensed images can be reconstructed by altitude and azimuth, according to hour angle and image scale in the pixel matrix.

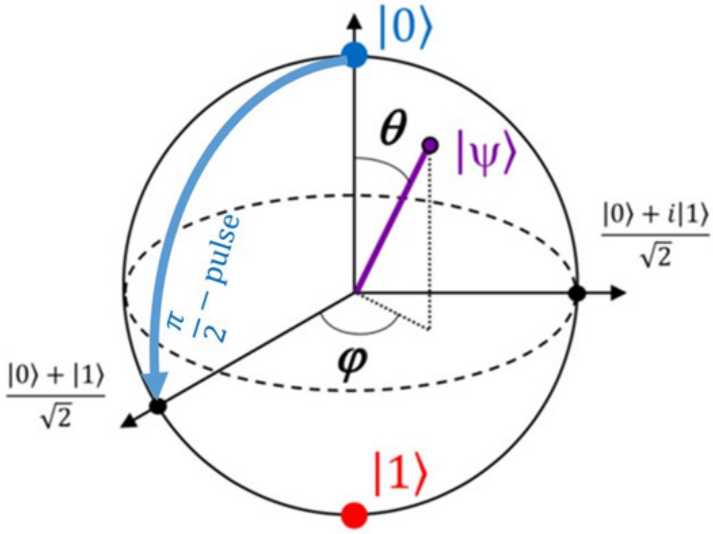
With the Zenith, the three-body is put into a single two-dimensional plane with coordinates, and more precise correction with local gravity can be done by adding local altitude and imaging plate angles. In the secondary plane, the azimuth of the celestial sphere becomes the barycenter for the mirror image of the observed object(s). Orbital distortions can be corrected with ground-based telescopes by a reversed motion analysis, and with space-based telescopes, the corrections can be embedded in the orbital designs.

The scale of the mirror images either depends on the Riemann-Zeta function or its inverse in the orbital cases. For the orbital cases, further expansions create new manifolds. It means that a cosmic-scale data structure will have multiple layer topology. In increasing the efficacy and automation in orbital cases, informatics designs and topological structure can be interlinked [17]. This would require inter-server designs.

2.2 Mathematical Proof

Modern number systems and computers use linear decimals for calculations. stated Turing's suspicions on the correctness of the Riemann Hypothesis, which was not adapted to Turing machines that shaped the prototypes of modern computers [18]. Apart from traditional decimals, most decimal systems are based on the infinite product of binaries, and quantum computing introduced the imaginary unit to the quantum qubit base. This introduction has enabled the possibilities for logarithm and natural logarithm bases for number and computation decimals, and the method proofs the possibility's potentials in representing and calculating a three-dimension number plane with a one-dimension number line.

The Bloch sphere defines qubit binaries with superposition; however, its computational potentials are limited in matrices forms from its decimal base in NOT Gate logics [4]. The method proposes a π decimal transition for natural logarithm superposition between two quantum qubits in duo core Central Processing Unit (CPU) designs to optimize the computation power of quantum computers. The eigenform binaries of quantum qubits seen in Figure 2 only considered ground and excitation states, while the element of alternating current with θ=2*π in*|*ψ*〉 =*cos*θ/2|0〉+ei〉 sinθ/2|1〉 has not been used. The NOT Gate logics restricted the lattice potentials of quantum computation logic tree, and the logarithmic functions can only be probabilistically calculated from the matrices [3].



$$|\psi\rangle = cos\frac{\theta}{2}|0\rangle + e^{i\varphi}sin\frac{\theta}{2}|1\rangle$$

Figure 2: The Bloch sphere with a π/2-pulse 'rotating' a qubit from the 0-state to a superposition state [4].

There is a correlation R^2=(π/2-*pulse*)(π/2+*pulse*),|ϕ|+-*pulse*|=$2^n\pi$ in the cycles with the π/2 resistance to the electron currents, and without discussing the material designs in a ballast resistor, another decimal from 2 to π applies to $i\phi = \ln\frac{|\psi\rangle - \cos\frac{\theta}{2}|0\rangle}{\sin\frac{\theta}{2}|1\rangle}$. The 2 from the base does not have to present an algebraic number, but the current count of the decimal shifts from qubits, and induces the π decimal. The dimensional number of 2, therefore, adds to the logarithmic calculation capacities of the CPU from the π decimal.

Conjecture 1: A three-dimension coordinate system can be bijective to a one-dimension real number line with chirality in its imaginary part in the form $T = \sqrt{x^2+y^2+z^2} \times 2\sqrt{\frac{(x^2+y^2)z}{3x^2+y^2}} \equiv \sqrt{z(x^2+y^2+z^2)}$ tan γ, and tan γ can be expressed in terms of partial differentiation equation. The concept of conjecture 1 is illustrated in Figure 3, and $\sqrt{z}$ is introduced for chirality of the transformation.

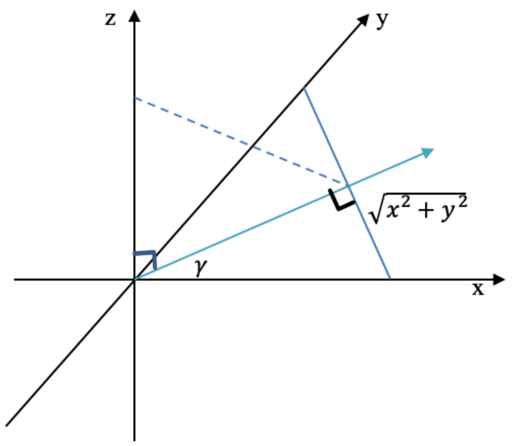


Figure 3: The trigonometric representation of conjecture 1.

Lemma 1: The function $f(\gamma) = \sqrt{z}\tan\gamma = \sqrt{z}\tan\frac{(2n-1)\pi}{2}, n \in \mathbb{N}$ is convergent. As for the algebraic values $\gamma = 2\sqrt{\frac{x^2+y^2}{3x^2+y^2}}$, the function f(γ) is convergent if *df/dz* is convergent. In the algebraic values $\frac{df}{dz} = 2\sqrt{\frac{x^2+y^2}{z(3x^2+y^2)}}$, it is seen that $|z(3x^2+y^2)| > |x^2+y^2|$ Since the inequality persists ($3x^2+y^2$)≥(x^2+y^2), the only possibility that the partial differentiation equation diverges is z→0. Therefore, by the finite difference method:

$$\frac{df}{dz} = \lim_{z\to 0}\frac{f(\gamma_0+z)-f(\gamma_0)}{z} = \lim_{z\to 0}\frac{\tan z}{\sqrt{z}}$$

With the integral test of $g(z) = \ln\frac{df}{dz}$ by the chain rule [19]:

$$\int_{-1}^{1} g(z)dz = \lim_{z\to 0}(\ln\tan z - \frac{\ln z}{2}) = 0 < \infty$$

Therefore, lemma 1 is proven.

Collaroy 1: In three dimensions, the tangent value of an angle is convergent.

Proof for chirality is trivial, and the remaining proof for conjecture 1 resides with *T,z≥0*. Proof for lemma 1 implies T is convergent for all variables *x, y,* and z. For *T,z≥0* to be bijective to the real number line, lemma 2 is necessary and sufficient.

Lemma 2: The inequality $T(x_0, y_0, z_0) - T(x_1, y_1, z_1) \neq 0, x_0 \neq x_1 y_0 \neq y_1 \vee z_0 \neq z_1$ holds for all *x,y,z.*

By Fermat's Last Theorem [20], let

$$\begin{cases} w^2 = x^2+z^2, when\ x_0 = x_1 \\ w^2 = y^2+z^2, when\ y_0 = y_1 \end{cases}$$

and

$$\begin{cases} u^2 = x^2+y^2 \\ v^2 = x^2+x^2 \end{cases}$$

Case 1: When $z_0=z_1$, the equalities $x_0=x_1$ and $y_0=y_1$ cannot both be the case. Therefore, in the equation

$$T = \begin{cases} 2\sqrt{\frac{(x^2+w^2)u^2z}{v^2+u^2}}, y_0 = y_1 \\ 2\sqrt{\frac{(y^2+w^2)u^2z}{v^2+u^2}}, x_0 = x_1 \end{cases}$$

the elements hold that $v_0^2 + u_0^2 \neq v_1^2 + u_1^2$ and that $\begin{cases} x_0^2+w_0^2 \neq x_1^2+w_1^2, y_0 = y_1 \\ y_0^2+w_0^2 \neq y_1^2+w_1^2, x_0 = x_1 \end{cases}$. Let

$H = \begin{cases} \frac{x^2+w^2}{v^2+u^2}, y_0 = y_1 \\ \frac{y^2+w^2}{v^2+u^2}, x_0 = x_1 \end{cases}$, the inequality $\frac{H_0}{H_1} \neq 1$ holds for all *x,y,*and *z*. Therefore, case 1 is proven with the exception when $z_0=z_1=0$. By the axiom of infinity, the latter is also proven.

Case 2: The proof is trivial for $z_0 \neq z_1$.

With conjecture 1 proven, the secondary qubit shares the same frequency phase as the primary qubit with the function *f(γ)*, where n connects the primary qubit to the secondary qubit and $\sqrt{z}$ serves as the continuity of current in time. The NOT Gate logics can therefore be enhanced for algorithm and logic tree agility, and the logarithmic calculation optimization thereon.

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3. Result

The brief technique in the research explained the light quanta approach to observational astronomy data. It sought to surpass the categorical rationale of the Hubble constant in the morphological universe. The method has been simplified to a two-dimensional double-plane model, and is extendable to higher dimensions. The method allows for more complex thermonuclear analysis through data nucleons in recombining complicated celestial phenomena with spectroscopy.

The method applies to space-based telescopes and informatics designs are conceptualized. With a simple estimation for a five-body problem from the vantage point of earth, the (5/2)=20 elementary dimensional vectors can produce (20/3)=6840 possible three-dimension planes [21]. It means that there is no possible computational capacity for a three-dimension progressive-scanned earth orbit design with graphics processing unit. The dimensional limitations in computational astronomy become a realistic barrier for qualitative research, especially considering cosmology. Even though CPU is sufficed for informatics designs and server designs, high operational flexibility is needed for precision limitations in automation, and limited foreseeability in the cosmic environment.

The reliance of the optical morphology of the galaxies can be overcome by gravitational lensing. The estimation for the gravitational scale estimations relies on the relativity theories and nuclear science. Qualitative research in astronomy still depends heavily on physics and mathematics, if not chemistry. It means that interdisciplinary approaches and collaborations are necessary for qualitative advancements. Therefore, documentation parameters and methodological approaches are interlinked. In the sociology of knowledge in interdisciplinary and transdisciplinary approaches, cognitive designs in cross-disciplinary communications are critical. For example, Lorentz transformation and special relativity adopted the same mathematical concepts and principles, even though the former falls more into chemistry. Differentiating cross-disciplinary repetition and cross-disciplinary interrater reliability would optimize collaborations.

The conception of the method is intended for the application in astronomical and cosmological research's engineering solutions. With the reverted thinking in orthogonal frequency-division multiplexing, the celestial multi-wavelength radiations can be seen as the inductive multiplexing signals to be detected and reconstructed in digital medium. Apart from the method's potentials in pure mathematics, there is an extensible possibility in future automation of space probes.

4. Discussions

Even though it is unlikely that current technologies can facilitate with high integrity and safety for automated pilot on space-based telescopes with informatics designs, lessons from the research suggest predictive machine learning for observation references is still possible. Para metrification of observation data in the storage systems with server-end designs can better facilitate access to Big Data management with virtual observatories and scientific data-based insights.

Artificial intelligence (AI) can optimize user interface for data interpolation. Since the key of AI is model training, and data management topological morphology, a logic tree based on knowledge management and hypothesis testing is compatible with the single-thread duo core quantum computing CPU conceptualization. Hypothetically, the AI and machine learning approaches to data management can optimize historic data and statistical analysis of data, so that predictive values from aggregated experiences in observational astronomy can be powered.

Schemes for color-coding will need scientific consensus. Data parameterization, visual rendering, and inter-layer calculations are the key elements that involve the color-coding algorithm designs. Even for true colors, it is no more than bio-organic detection base compared to instrumentation detection plates [22]. The optical schemes' UV bands may be important for manned missions, but cosmological objectivity cannot take the same ethics as true color schemes.

Cosmological objectivity from new color schemes can further the understanding of the dark universe and deepen the understandings on the evolvement of the universe, with the origins of life included. Aggregated schemes will have to be based on quantum physics and quantum gravity, with potential application benefits in cosmic environment predictability. As the development of astronomy is a discovery paradigm in the conception of the first-generation technologies, data management can serve for the paradigm interlinkage between discovery and insights [23, 24].

5. Conclusions

Orbital control and reprogrammable orbital devices may be a premature idea from epistemic optimism [17]. The asynchronous replacement from the optimistic idealism in data management has become an intermediate solution with the possibilities from existing technologies. The method can ease the cognitive burdens from the epistemic duality needed from the practice in the initial experiment, and provide better predictabilities for future observations [9].

Calculations for complex planes in dimensions higher than three will need at least quadruple core quantum CPU, but is extensible from the initial conceptualization. The specific notes serve as proof-of-concept in a cross-disciplinary framework as feasibility study, and the fundamental mathematical proofs will need to be elaborated in a separate article.

The base system and backend will serve for reference for future command and control modules. Predictive and operational reliabilities for a basic data system can save human resources costs in informatics organization methods. Algorithmic leaning through AI training and human-machine interactions can provide future design rationales by treating learned models as metadata. Extensible compatibilities in informatics will be something to be discussed in the future.

It is worth noticing that AI training is no different from literature production. Current AI algorithms collect prototype models from the internet, and the graphical abstract resulted from my input on images.ai with "a white hole and a black hole emitting dark matter by the fifth cosmic force". It resembles the direct multi-wavelength histogram layer addition from the earth's vantage point of traditional observation presumptions, without correction by superdeterminism with orbital solutions [25]. Big data quantum computing and quantum tunneling in AI will be a future software consideration.

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