Guynn and Suleiman:
Comparing Their Structure of Matter and Space Approaches

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In this short contribution *Suleiman*'s Information Relativity Theory (*IRT*) will be compared with the structure and matter approach recently developed by *Guynn*. Interest is once more awaked by the "apparent" non-locality of all physical respectively cosmic actions due to the postulated existence of a superluminal graviton vacuum condensate [1] [2]. The *IRT* approach is clearly a local theory of matter and energy [3]. We begin with *Guynn*'s seminal approach introducing *Thomas* precession as basis for the structure of matter and space [4]. The difference velocity as effective velocity between rotation velocity and precession velocity of rotation bodies is given by

$$\boldsymbol{v_d = v(2-\gamma)} \tag{1}$$

where $\gamma = \frac{1}{\sqrt{1-x^2}}$ is the well-known *Lorentz* factor. The *Lorentz* factor can be represented by a *Mac Laurin* power series expansion

$$\gamma = \frac{1}{\sqrt{1-x^2}} = (1+(-x^2))^{-1/2} = 1 + \frac{1}{2}x^2 + \frac{1\cdot 3}{2\cdot 4}x^4 + \frac{1\cdot 3\cdot 5}{2\cdot 4\cdot 6}x^6 + \cdots \tag{2}$$

If we just take not more than the 4 outlined terms of the series, a varied formula for v_d is tailored cancelling terms mainly caused by precession

$$\tilde{v}_d = v\left(2 - \left(1 + \frac{1}{2}x^2 + \frac{1\cdot 3}{2\cdot 4}x^4 + \frac{1\cdot 3\cdot 5}{2\cdot 4\cdot 6}x^6 + \cdots\right)\right) \tag{3}$$

Modifying this relation by a factor 0.4 applied to the outlined last term would give the relation (3a) with exact zero at the value $x = 1$

$$\tilde{v}_d(mod) = x - \frac{1}{2}x^3 - \frac{3}{8}x^5 - \frac{1}{8}x^7 \tag{3a}$$

The maximum of $y_m = 0.463178$ is at $x_m = 0.642438$.

Next we recast *Suleiman*'s matter energy density formula $h(x)$ [3]

$$h(x) = x^2 \cdot \frac{1-x}{1+x} = x^2 \cdot \frac{(1-x)^2}{(1+x)(1-x)} = x^2(1-x)^2\gamma^2 \tag{4}$$

where $x = \beta = \frac{v}{c}$ is the recession velocity.

Then we can simply write down the square root of this formula yielding

$$f(x) = \sqrt{h(x)} = x(1-x)\gamma \tag{5}$$

The function $f(x)$ has a maximum value of $y_m = \sqrt{\varphi^5}$ at $x_m = \varphi$, where $\varphi = \frac{\sqrt{5}-1}{2} = 0.6180339887$ is the golden mean [5]

Whereas *h(x)* represents the energy density, *f(x)* is proportional to a speed and can be compared with *Guynn*'s formula for the difference speed after coordinate transformation and simplification. For this procedure we can use approximation for the maximum of *Guynn*'s difference velocity β_m. One can confirm the following approximations [5]

$$\frac{v_m}{c} = \beta_m = \sqrt{3} \cdot \left(\sqrt[3]{2} - 1\right) = 0.450196459 \ldots \tag{6}$$

$$\approx \frac{\sqrt{2}}{\pi} = 0.450158158\ldots \tag{7}$$

$$\approx 5 \cdot \varphi^5 = 0.4508497 \ldots \tag{8}$$

$$\approx \frac{3}{2} \cdot \sqrt{\varphi^5} = 0.450424549 \ldots \tag{9}$$

The result of transforming *f(x)* to $v_d(x)$ is a new formula for the curve *t(x)* which is almost identical with the curve given by *Guynn*. We obtain

$$\boldsymbol{t(x) = x - \frac{x^3}{\sqrt{3} - \frac{3}{2} \cdot x^3}} \tag{10}$$

Maxima and zeros of both functions are summarized in **Table 1**. A better adaption using a somewhat more complex formula than given by relation (10) is the following one

$$\boldsymbol{\tilde{t}(x) = x - \frac{0.97291 \cdot x^3}{\sqrt{3} - 1.5432 \cdot x^3}} \tag{11}$$

Another φ-based alternative was already published [5]. **Figure 1** shows the curves for comparison. All curves show the same slope at the origin of 1.

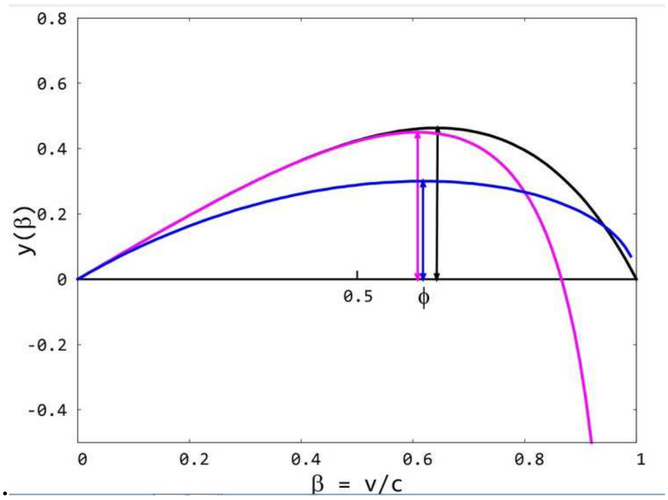

Figure 1. Comparison of the curves (1) magenta, modified (3a) black and (11) blue.

Table 1. Numerical Results of *Guynn*'s Approach and Modified *IRT* Results using Relation (11)

***Guynn*'s Approach**			***IRT* Approach**		
Notation	Numerical Result		Numerical Result		Difference
v_m/c	$(2^{2/3}-1)^{3/2}$	0.450196464		0.450197	0.000006
v_1/c		0.608308700		0.61330	0.004991
v_0/c	$\sqrt{3}/2$	0.866025403	$\approx \sqrt{3}/2$	0.8660188	-0.000007
v_2/c		0.915920029		0.919391	0.003477
***ε*-Infinity Approach** [6]					
e_m	$\varphi^5/2$	0.0450849718747			
β_ε		0.8929711249070	$\frac{2}{\sqrt{5}}$	0.894427191	

In addition, we compare the areas under the curves represented by the relations (5) and (1)

$$\int_0^1 f(x) = 1 - \frac{\pi}{4} = 0.2146018366 \tag{12}$$

$$\int_0^{\sqrt{3}/2} v_d(x) = \frac{1}{4} = 0.25 \tag{13}$$

It means that the area is increased by about 16.4 % when pushing together the curve *f(x)* to get finally the curve $v_d(x)$.
What is the quintessence of the result? The structure of matter and space approaches of *Guynn* and *Suleiman* are almost compatible when in the *IRT* theory *Thomas* precession would be adequately implemented.

The matter energy density according to the *IRT* theory delivers an excellent polynomial approximation. It also applies for the *Hardy* function [7] [8] [9]

$$\tilde{h}(x) \approx \sum_{n=1}^{\infty} x^2 \cdot \left(\frac{1-x}{2}\right)^n = x^2\left(\frac{(1-x)}{2} + \frac{(1-x)^2}{4} + \frac{(1-x)^3}{8} + \frac{(1-x)^4}{16} + \frac{(1-x)^5}{32} + \cdots\right). \tag{14}$$

In Figure 2 the *Hardy-Suleiman* function is compared with its power series expansion summed up only to the fifth term.

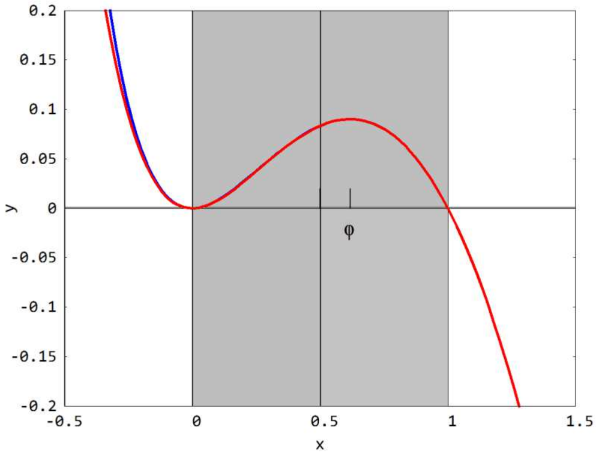

Figure 2. Comparison of *Hardy*'s function (blue) with its polynomial expansion (red). Only the first 5 terms are use as given by relation (14). The maximum at φ is exactly φ^5.

However, ‘non-locality’ of two particles as stated by *Hardy* must be now recast in ‘apparent non-locality’ [7].

References

[1] Markoulakis, E. (2024) Superluminal Graviton Condensate Vacuum. *International Journal of Physical Research* **12**, 45-61.
[2] Otto, H.H. (2024) Beyond Higgs Boson, Graviton, and “Apparent” Non-Locality *ResearchGate.net*
[3] Suleiman, R. (2019) Relativizing Newton. *Nova Science Publishers*, New York.
[4] Guynn. P. (2018) Thomas precession is the basis for the structure of matter and space. *viXra*: 1810.0456, 1-27.
[5] Otto, H. H. (2022) Comment to Guynn’s Fine-Structure Constant Approach. *Journal of Applied Mathematics and Physics* **10**, 2796-2804.
[6] El Naschie, M. S. (2004) A Review of E-Infinity and the Mass Spectrum of High Energy Particle Physics. *Chaos, Solitons & Fractals* **19**, 209-236.
[7] Hardy, L. (1993) Nonlocality for Two Particles without Inequalities for Almost All Entangled States. *Physical Review Letters* **71**, 1665-1668.
[8] Mermin, N. D. (1994) Quantum mysteries refined. *American Journal of Physics* **62**, 880-887
[9] Otto, H. H. (2020) Phase Transitions Governed by the Fifth Power of the Golden Mean and Beyond. *World Journal of Condensed Matter Physics* **10**, 1-22.