Applicability of Single Unified Solution By Quantum Pair Extended To Dispersion of Parameters In State Transition & Connection With Indeterminacy By The Golden Ratio

Mayukh Maitra

Abstract- *The first part of the paper presents the implementation methodology of the single unified solution, given by a quantum pair, extended to dispersion of a parameter in the state transition. The second part draws a connection between the dispersion and indeterminacy that is given by the Golden Ratio.*

Keywords- quantum state, dispersion, phase stability, singularity, entanglement, indeterminacy.

DEFINITION :
The formula, by the single unified solution [Ref.1], is given as :
S := (1/2).{ exp((1/a).ln(a)) + 1 - exp((1/(1-a)).ln(1-a)) }; where (a) is a linear variable of probability.

I. INTRODUCTION

The single unified solution [Ref. 2], shows nutation for a quantum pair [Ref.1], indicating the existence of hidden variables. The hidden variables are owing to inherent characteristics of a state. The formula reduces to [f(a) = a], where (a) is a random variable, taken as increasing in a cumulative manner. The phenomenon of nutation shows an inequality to be present and that there is also a reversal of inequality. This has been demonstrated by (S), a polynomial and non-linear, which is defined by the centre of the upper and lower bounds of entropy, where (S) is found to take predominance over (a). The phenomenon is attributable to superposition and wave phase interference for a quantum pair.

It is to be noted, there is the hidden variable for quantum indeterminacy that is represented by the uncertainty; and there is the entropy that represents the extent of dispersion, which is measurable. Furthermore, as the dispersion, that is the centre of upper and lower bounds, reaches no deviation at the point of entanglement; the uncertainty, at the centre for the system and the surroundings, reaches the point of infemum or greatest lower bound.

PART – I

(1) EQUATION OF STATE

The application of the single unified solution extended to the equation of state, that is exponential, at an instant of time, which shows that for state transition a point moves to another at a distance. There is a point of equality where the dispersion equates with the originating function. And there is the point of entanglement, that is a singularity for all functions, as an unknown, where the point does not move away.

(2) BEFORE EQUALITY

Prior to the point of equality, a transition state shows an enhancement at a higher level, where the inequality is given by: [S $\geq$ f(a)] ; and the indeterminacy starts increasing from zero at the origin.

(3) AFTER ENTANGLEMENT

After the point of entanglement, there is reversal of the inequality, where the state transition shows a gradual move at a lower level; and indeterminacy marginally decreases after reaching the infemum.

(4) STABILITY

There is the point of entanglement, at a universal constant and there is a contraction about the point of equality, that is an arbitrary constant.

The point of equality gives the equation of a straight line as is extensible for the stipulated interval of contraction; such that phase stability is retained, or preserved.

Verticals: There is a level rise of dispersion at the point of equality by one unit above the central value and at the entanglement of the originating function the dispersion level falls to half unit below the central value, in two units of time. That shows, a linearity assumption for the dispersion holds, by ratio.

PART – II

(i) Connection

The Single Unified Solution has been derived from the primary relation between the entropy and uncertainty, [Ref.3], that is written as: [|du| = 0.6 ds]; where |du| is the average uncertainty, absolute, taken for a known system and the surroundings and (ds) is the difference between the appropriate upper and lower bound of entropy.

This shows there is a connection, as given by the famous Golden Ratio, denoted by [phi]: 1.618... , a number which is real and irrational; and the ratio [1/phi] is: 0.618...; such as, the algebraic product of the inverses is always the identity of one.

Thus: the difference between square of dispersion and square of indeterminacy equals to the ratio [1/phi], that is: 0.6, truncated to one decimal place.

(ii) Proof

The exponential and the natural logarithm with base (e) are inverse transforms, where the exponential of one is: 0.367...; which gives the one's complement as: 0.632..., or 0.6, approximately. The ratio [phi] gives the unique connection for the logarithm and the exponential. And the ratio [phi] serves as the unique connection where the additive inverse is non-zero identity, that is the absolute one.

(iii) Geometric

The ratio [1/phi], by trigonometry, gives inverse tangent [theta] as: (pi/6) radians, or 30 degrees, approximately, which is the slope or inclination from the horizon, for the straight line, where both the boundary points are fixed. That is the slope of the exponential relation as: [theta] from the horizon, which remains the same for the dispersion, by geometry.

(iv) Symmetry

The linear ratio [1/phi] gives the isometric scale of two to three, approximately, that is the ratio (1:1:1), in three dimensions from two dimensions. There is the symmetry in perspective.

(v) Determinism

The indeterminate, such as the partial measure of uncertainty and the complementary part, that changes in a ratio, show multiple values for each argument -- in a function space, where there is some inherited structure by the ratio, leading to a vertical inversion -- that gives rise to distinctive parameters at each quantum state.

II. CONCLUSION

The implementation of the single unified solution, extended to the equation of state, simultaneously between linear and non- linear, where both boundary points are fixed, is focussed at the transition points:-

1. The initial bound: there is an enhancement of dispersion, at a higher level;
2. The equality: no deviation for a distance in the middle, where there is linear approximation;
3. Verticals: the ascent of dispersion about the central value is twice the descent, in the even interval of time, where the linearity assumption holds by ratio;
4. The entanglement: there is a gradual move of the dispersion, that follow, at a lower level.

The applicability of the single unified solution by a quantum pair extends to the learning curves, i.e. having a linear variable, in the equation of state: for instance, quantum mechanics, quantum metrology, quantum information, quantum computing, quantum field theory, quantum cosmology and quantum technology.

The indeterminacy is comprehensible by the deterministic and a connection with dispersion is drawn, by the ratio of the mean and the extremes, by geometry is proven. The finding is immensely significant, for that uniquely relates the theory with the real world phenomena.

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The author is M. Tech. in Aerospace Engineering and pursued as Research Scholar in Reliability Engineering. The author has vast experience in investigation of aircraft events and failure mode and effect analysis for systems. The author has published several books in probability in information theory and reliability analysis. The author has done research work since last one and a half decade. His present area of interest is quantum theory.