WAVE FUNCTION TO PARTITION FUNCTION: A CORRELATION

(Jaydip Datta)

In this note the statistical thermodynamics is correlated to wave function through mathematical probability. The note can be subdivided into two following portions.

Keywords :

Randomisation , Wave Function , Probability Density Function , Multiplicative Probability , Partition function , Correlation (K.P) coefficient , Probability , Weights , Stirling's Approximation, Boltzmann , Sigmoid function .

1. **STATISTICS** -THE BASIC OF STATISTICAL THERMODYNAMICS: A CORRELATION – It

is analysed by linear regression method by Pearson coefficient , In our earlier Review some descriptive statistical features like linear regression aspects of Karl Pearson Coefficient / Correlation coefficient (1) has been studied specially. But the knowledge of Basic Statistics is the foundation course of STATISTICAL THERMODYNAMICS. The significant Correlation (R^2 lies between 0.2 – 0.85) is nothing but the measure of PROBABILITY .Thus the Thermodynamic Probability (T.P) is a function of Weights of the Configuration (W) (2) Stirling's approximation is also a good convergence with T.P as well randomization aspects of Entropy or Weights of Configuration (W) .

2 . **PROBABILITY** : A THE BASICS OF WAVE FUNCTION - The term probability widely used in statistics is a measure of of spontaneity of a system . In this note we have an attempt to correlate the Probabilistic approach between the wave functional concept NORMALIZATION and the algebraic relation of the term probability .

NORMALISATION OF PARTITION FUNCTION:

In this report we wish to report a most probable approach of Normalisation on Partition function and also the nature of thermal wave function as a normalised parameter. But the main duality / paradox / is **shi** (wave function) is an intensive property depends on electronic nature But the Molecular wave function / Thermal wave function is a molecular property rather distribution so it is an extensive property . Now our attempt is to correlate the two properties through a mathematical theorem ie NORMALISATION.

ALGEBRAIC THEORY OF PROBABILITY:

$P(A) + P(B) = P(A * B)$ – Since Probability is always multiplicative Eqn (1)

Here mod $[Shi]^2$ is known as **probability density function** of an electronic orbital

. Applying algebraic equation of Probability,

$Shi[A] + Shi[B] = Shi[A] * Shi[B]$ -----Eqn (2) | By Comparing Eqn (1) & (2) $Shi[A] + Shi[B] =$

$[Shi]^2$ ----- Eqn (3)

Equation (3) is the Conclusive Correlated Equation . So greater is the $[Shi]^2$ greater is the Probability .

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