On the structure of photons and awareness of lengths, that decoherence is an interaction of dimension - calculations within structure.

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Abstract: Using probabilities, the standard normal curve, density functions, the double slit experiment etc the author analyses the relationship between an abstract structure of photons (or wave/particle duality) , awareness and how calculations might be performed. Perhaps the arbitrary nature of information represented as 0 or 1 may not be so arbitrary or rather that the equations can be construed to suit binary values, and as written in previous papers, information may be a slippery concept.

Introduction: The main concept is to treat waves such as photons as physical sinusoidal structures. Approximating these as standard normal curves we can analyse structure and perhaps do calculations. Truncating the standard normal and taking the negative we can approximate a sinusoidal function. Using a constant we can supply an area under the standard normal. Relating a density we can perhaps mathematically analyse how the double slit experiment can analyse structure and possibly calculations.

Results: The standard normal gives a probability, so taking the logarithm we are left with the exponent. Multiplying the LHS by a probability we have the entropy:

$ds = p_i \ln p_j$?

Taking elements of the sinusoidal structure of waves we have, perhaps:

$$P = f\left(n\,\Delta x\,y - \frac{x}{2\pi}\right)$$

Where the x terms is elements and multiplying by y gives an area. The second x term is where the curve repeats itself.

Also remember the alternative definition of entropy where x is replaced by ƛ

$$ds = \frac{ƛ - Bƛ}{ƛ'}$$

Now for the connection between the double slit and structure. Of waves/ particles. The density within the curve and the density of constructive interference is:

$$\rho = P = \frac{N}{x^{\mu}}$$

Where N is the number of elements. Nb for collapse :$\mu \to 0$

And N is returned. This demonstrates the role of dimension in collapse. Rewriting:

$$x^{\mu} = \frac{N}{PA}$$

A is an area.

Now to find an average of a function with density ρ.:

$$< f(j) > = \Sigma f(j)\rho$$

And for interference:

$$d\sin(\Theta) = \big(m + f(n)\big)ƛ$$

Or:

$$m' = \frac{dsin(\Theta)}{ƛ} \rightarrow \; N$$

Thus using the uncertainty :

$$ƛp > h$$

$$\frac{d\sin(\Theta)}{\frac{h}{p}} = \frac{\Sigma N}{x^{\mu}}\,\Delta x$$

Thus momentum:

$$p = \frac{h\frac{\Sigma N}{x^{\mu}\Delta x}}{dsin(\Theta)}$$

Or using the choice functions E and B where $E_k = pc$

$\frac{[E-B]E_k}{c} = (h$ ΣN/x^μ [E-B]x)/dsin(Θ)

Now for a quick calculation, unrelated to the proposed calculations within structure. For a basic unit of "thought".

$$E_k = \frac{\frac{hcN}{x^{\mu}}}{\sin(\Theta)}$$

Or:

$$E_k = \frac{1.98\,e - 25\,N}{\sin(\Theta)}$$

Replacing on one side of the equation :

$$h \;\; by\, \eta$$

where $\eta\eta = k_B h = 1.45\,e - 57$

we have :

$$N = 4.5\ e\ 23\ \ bits$$

Perhaps related to “thought”

References:

Serway, R. et al. Physics Vol 2. Asia Pacific edn.