Re: HUP Fails Via Nonexistent Distributions 2: The Uniform Claim

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- *From*: "srp" <srp@xxxxxxxxxxxx>

- *Date*: Thu, 18 Aug 2005 16:30:13 GMT

"OsherD" <mdoctorow@xxxxxxxxxxx> a écrit dans le message de news:
1124338105.927016.277470@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
> >From Osher Doctorow mdoctorow@xxxxxxxxxxx
>
> Max Jammer's The Philosophy of Quantum Mechanics, Wiley: N.Y. 1974,
> page 6, points out that according to Born's probabilistic
> interpretation the probability density of finding the system at
> position q is:
>
> 1) /w(q)/^2
>
> where w is the wave function. Also, the probability that q is in [L1,
> L2) (I use L for his lambda) is:
>
> 2) P(L1 < = q < L2) = //(E_L2 − E_L1)w//^2 = I/w(q)/^2 dq
>
> where I...dq is the integral from q1 to q2 with regard to q. The
> expression E_L is called the "resolution of identity" such that:
>
> 3) E_L(w(q)) = w(q) for q < = L, E_L(w(q)) = 0 for q > L
>
> Readers familiar with mathematical probability−statistics will
> recognize E_L as the integral of the "indicator function" I_L:
>
> 4) I_L(q) = 1 if q < = L, I_L(q) = 0 if q > L
>
> where the integral is from 0 (say) or −infinity to L.
>
> The uniform probability distribution in mathematical
> probability−statistics is the only one with these properties, which
> means that Born assumed that the microscopic domain is uniformly
> distributed! Since it is common to find Gaussian/normal distributions
> in the quantum domain, not only is this experimentally unverified but
> it is inconsistent with other results in quantum theory and quantum
> practice. Moreover, if both position and momentum had uniform
> distributions, then there is no sense to the claim that one is
> "conjugate" to the other since both have definitely defined population

> means/expectations and variances and standard deviations as well as
> similarly defined probabilities. The only scenario that comes remotely
> close to "conjugate" HUP is assigning one variable, say position, to
> the uniform distribution on some finite interval, say (0, 1), and
> assigning the other variable to some varying interval like (0, L), and
> letting L −−> infinity. Even if this were done, at no time and with no
> scenario will either uniformly distributed random variable be "vague"
> in any sense.
>
> In fact, the graph of a uniform distribution is a horizontal line
> segment. For example, the graph of a uniform probability density
> function (pdf) on (a, b) or [a, b] is a horizontal line segment above
> the x axis between a and b where a < b, and the rest of the graph has 0
> vertical position, that is to say is the remainder of the x axis. The
> vertical axis here represents the value of the pdf, usually between 0
> and 1 except for example when distributions are extremely concentrated
> around one point in which case it may exceed 1 for continuous
> distributions. The height of the graph above the horizontal or x axis
> is 1/(b − a). So if a = 0, the height would be 1/b, and if b = L −−>
> infinity, all that happens is that the height −−> 0 without reaching 0
> at any finite time. What this means "physically" is that whatever is
> involved gets more and more "equally" or "uniformly" distributed along
> more and more of the real line, with the limit being "equally
> distributed" along the entire real line (but is never attained).
>
> There is nothing "conjugate" about this scenario, but what is even more
> remarkable, if two random variables were related in the above manner on
> for example [0, 1] and [0, L], they would be influencing each other
> rather than being causally unrelated! In other words, position x and
> momentum p would themselves not be causally unrelated but one would
> influence the other and presumably both influence each oher. Thus, the
> HUP would imply either the Weak HUP (WHUP) or something very similar to
> it.
>
> It is true that as [0, L] gets bigger and bigger as an interval, the
> variance increases since the latter is (1/12)(b − a)^2 or here
> (1/12)L^2. However, for the uniform distribution all this reflects is
> the largeness or large size of the entire real line, since "equally or
> uniformly distributed" continues to hold for both variables
> proportionately to the size of the domain (the line segment in which
> the distribution has a support (is > 0)).
>
> Osher Doctorow

Anyone in the accelerator community knows full well that it is possible
to know "very precisely" the exact position AND momentum of an electron
at any given position on its "very precise" trajectory in high energy
circular
accelerators, and that it is even easy to "predict" where it will be on its
trajectory at any moment in the near future as long as both sustaining
fields are maintained constant.

Ref: "Principles of Charged Particle Acceleration", Stanley Humphries, jr.

The hup is nowhere in sight when the chips are down to practical experimentation.

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- ***Follow−Ups***:
  - ♦ ***Re: HUP Fails Via Nonexistent Distributions 2: The Uniform Claim***
    - ◊ *From:* OsherD

- ***References***:
  - ♦ ***HUP Fails Via Nonexistent Distributions 2: The Uniform Claim***
    - ◊ *From:* OsherD

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