Re: One Photon Double Slit Reinterpretations

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From: Uncle Al (*UncleAl0_at_hate.spam.net*)
Date: 01/23/05

Date: Sun, 23 Jan 2005 13:46:54 −0800

Zigoteau wrote:
>
> Hi, Uncle Al,
>
> > One could certainly fire single electrons and add up received charge
> > accurate to one electron at a time (Faraday cup). Landle is a
> > typical crank/troll − no scholarly knowledge of the discussion topic,
> > impossible to educate, mathematically crippled, and psychotically
> > perserverative in pulling crap out of his ass. The universe does not
> > care about opinion.
>
> That's all well and good, Al, but if you really didn't care what Landle
> thought, you would ignore him. I have always been, and continue to be,
> impressed by the depth of experience and understanding you show in both
> sci.physics and sci.chem. Yes, Landle is a qubit short of a quantum
> computer, but what satisfaction do you get out of insulting him?

Like whittling, it is less the shavings or the resulting sculpture
than the process that entertains. The willfully stupid deserve to be
crushed as a flush toilet is more than a receiving vessel.

> > A CCD output does correspond to single photons. Turn off the single
> > photon input and let the detector sit. Do you get a diffraction
> > pattern accumulating? There is no reason to fire a stream of single
> > photons. One could fire tenth or hundredth photons. One
> > photon/second or minute and wait for the pattern to accumulate.
>
> I don't want to get in too deep here, and I know exactly where you are
> coming from. QFT makes predictions which are confirmed by experiment to
> the tenth decimal place. But it's still crazy. Certainly the Copenhagen
> Interpretation of it.

I make no claims as to validity of QM, nor does QM. "The math is only
metaphor." Nevertheless, one cannot fault single photon two−slit
diffraction with a coincidence argument. The intensity over time can
be reduced to arbitrarily small values and the two−slit diffraction
pattern still evolves by the book.

It doesn't have to be a vacuum slit in an opaque barrier, does it? What about two local implanted microstrips of substantially altered refractive index? Easy to do with semiconductors and IR light.

A single photon approaches a double slit. Would you be happier with Many Worlds wherein half the time it passes through each slit discreetly and the two possible futures interfere with each other on the other side? Or a single photon passes through one slit and its mirror image in jellium or whatever goes on to be naughty? Then, do dielectric slits with very large work functions (very deeply buried HOMOs) give altered patterns? Or Heisenberg does his thing and you cannot determine which slit passed the photon − they both did. Hence quantum eraser and quantum double eraser experiments.

A bigger problem is the use of single charged particles re de Broglie waves or much bigger lumps re C60. Arguing photon subtleties is one thing. Putting C60 through a double slit experiment is something different. Why stop there?

Consider a suitable double slit, array of slits, zone plate, whatever whose elements are alternate Peltier heater/cooler materials. One can now have alternating hot and cold slits on a very small scale. Take a fluxional organic molecule that rearranges to itself with permuted atom connectivity like bullvalene (slow) or semibullvalene (fast).

Make a nice collimated molecular beam, attenuate intensity to single molecules, and shoot through the hot/cold slit array. Have the temp of the molecule of choice be sufficently high that it rearranges several cycles during its passage through the slit. Will its phase coherence decohere as "one half of it" passes through a hot and cold slit with different rearrangement kinetics? OK − what comes out the other side when the two wavefunctions recombine into an observable?

Ditto a beam of resolved chiral molecules in two−slit diffraction. Is chirality retained after recombination? One can make a very strong argument that things will go sour via Hund's paradox,

F. Hund, Z. Phys. 43, 805 (1927)
http://arXiv.org/abs/cond−mat/0203017
http://arXiv.org/abs/quant−ph/0303024
http://arXiv.org/abs/quant−ph/9908008

Certainly one could micropattern alternately chiral slit material and relieve two−slit symmetry that way. Will the result be a one−slit patern?

> I'm disappointed that noone has responded to my post about the Coulomb
> blockade and the single−electron transistor. Now there's a test case
> for quantization.

It requires more than an idiot to understand it, even to maunder about it afterwards. We'll see how it fares in sci.physics.reaserch.

> > Any argument against SOP photon diffraction must scale to
> >
> > www.quantum.univie.ac.at/research/matterwave/c60/
>
> The C60 experiment is important, but I note that it was (a) published
> in Nature, and (b) performed in a country which was once part of the
> Second Reich, and then the Third. I was once told by a student in such
> a country that he had repeated an experiment 15 times until he got the
> result that his supervisor told him to get. You may be familiar with
> the name "J. Hendrik Schoen". If he'd gotten a Lehrstuhl at home noone
> would have dared question den berühmten Herrn Professor Doktor. I have
> come across many other instances, that will never be unveiled because
> they are just not that important.

Has there been any criticism of the results, experimental or theoretical? They went on to use C70, polyfluorinated C60, and say they wll attempt a small virus.

> Let us calculate a few properties of C60, as I am sure you have, being
> a chemist as well as a physicist. Each carbon atom has mass 2e−26 kg,
> and is located at 3.5e−10 m from the center, giving a total moment of
> inertia of 1e−43 kg.m2. The energy of the first rotational excited
> state is therefore 1.13e−25 J. Hence this state is appreciably excited
> at any temperature above 0.01K.

Fair enough. Undeniably there were a large number of excited vibrational and rotational modes at molecular beam furnace temp. Probably some low−lying optical modes, too.

> I will wait until the experiment is repeated by an independent group
> before taking it too seriously.
>
> Any news yet from China?

All is quiet. The first hemiparity Eotvos experiment, optically right−handed quartz vs. fused silica, was running a perfect null. The balance and test mass configuration are shown to have no extraneous outputs. The full parity Eotvos experiment is next, left−handed vs. right−handed single crystal quartz. We lost our left−handed single crystal raw material to an autoclave rupture. That puts off obtaining the next one until about April. Attempts to source natural left−handed quartz went poorly vs. the six kinds of twinning.

If spacetime is achiral (metric gravitation) all three experiments will null. If spacetime is chiral (affine gravitation) then ordinary test masses and one extremal parity test mass will be low energy interactions − like putting a sock and a left shoe on a left foot. They slide right on. The other extremal parity test mass will be the

high energy anomaly − right shoe on a left foot.

We might guess that spacetime would be left−handed re parity breaking in the Weak interaction. The *geometrically* right−handed parity test mass would then be the anomaly. Due to opposite directions of property definition, commercial optically right−handed quartz is space group P3(2)21 geometrically left−handed. The full parity Eotvos experiment is the deciding observation. Hurry up and wait.

Arguments about Hundt's Paradox re chirality and Green's Function re anomaly sourcing are laid to rest in qz.pdf below, in two appendices.

> And just by−the−by, do they speak White? (I'm more of a yellowish pink
> color myself).

"8^>) Both my French mathematician and my Chinese physicist are fluent in written English. If there were difficulties we could engage a professional diplomat as arbiter and end up with textually neutral round robins in hieroglyphics. Having been born and raised in Brooklyn, NY I suspect face time will have them doing better than I orally.

Hyper−Right Wing Uncle Al has no problem doing science with PR China or Force Frappe nannies. Ditto Canada (the horror), Germany (about those camps), the UK (vegetable oil allowed in chocolate), Switzerland (perfectly amoral), Belgium (Penal Code, Article 561, para. 7), or anybody else who has fast CPU−cycles to volunteer. If this thing works our respective parent countries can make public asses of themselves on their own nickels. If not, then 12 gilded paperweights can be auctioned on E−Bay.

My end is currently crunching a second generation extremal parity test mass,

http://www.mazepath.com/uncleal/pddense.png

Single CPU data finishes by second week in February (including a week in an Athlon 55FX/2.6 GHz with 2 GB Corsair Xtreme DDR RAM on an ASUS "A8V Deluxe" K8T800 Pro Chipset motherboard. Goody). If anybody has a cluster that is not doing anything or needs to have a defective node located...

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Uncle Al
http://www.mazepath.com/uncleal/
 (Toxic URL! Unsafe for children and most mammals)
http://www.mazepath.com/uncleal/qz.pdf