Re: Why field theories are deterministic, but QM isn't?

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- *From*: Igor <thoovler@xxxxxxxxxx>
- *Date*: Mon, 23 Mar 2009 15:56:30 −0700 (PDT)

On Mar 23, 5:35 pm, duda...@xxxxxxxxx wrote:

> Quantum electrodynamics (relativistic quantum field theory) is believed to be better approximation of physics than quantum mechanics − for example because it allows for extremely accurate predictions of Lamb shift.http://en.wikipedia.org/wiki/Quantum_electrodynamics
>
> One of formulations of field theories is due to Lagrangian density − physics finds the field which minimizes integral of this density over four dimensional space − so called action.
> Now using Euler−Lagrange equations, we can find necessity condition for such minimization, which is in form of time evolution − we get 'evolving 3D' picture.
>
> These equations are completely deterministic − we don't have a problem with for example probabilities, wavefunction collapses ...
>
> So why its predecessor which we commonly use − quantum mechanics is completely undeterministic − we can usually talk only about probabilities????
>
> For me it clearly shows that QM is forgetting about something − kind of 'subquantum noise' ... which determines quantum choices.
> We cannot fully measure QM ... so it's probably even worse with this 'subquantum information'.
> We can say only about probabilities of quantum choices − but in fact they should be deterministic − they are stored somewhere there!
>
> What we can talk about is that events have been causally connected in the past − we call it entanglement: if two photons have been created together we cannot know what spin they have, but we know that it's the same one.
>
> So from our point of view − the future will decide which of entangled events will be chosen ... but in fact it's written in some subquantum information, but we cannot even think about measuring it.
>
> Bohm's interpretation uses 'pilot−wave' which goes into future to

choose how to elongate trajectory.
But maybe it would be better to use CPT conservation as in QED and try to interpret QM fully fourdimensionally.
Now everything is clear:
− probability is proportional to the square of amplitude, because it has to agree in both past and future halfplanes,
− knowing only the past we can predict only probabilities,
− entanglements means that events are causally connected in the past. One of them will be chosen in the future (as in Wheeler's experiment).

Here is expanded this topic:http://www.advancedphysics.org/forum/showthread.php?t=11844

What do You think about it?

Wave function evolution is deterministic in all quantum theories. Observables, on the other hand, always obey Heisenberg uncertainty relations.
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