Re: "quantum mechanics and experience"−−non separability

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<richardconers@yahoo.com> a écrit dans le message de
news:9543a42e.0410161600.74d67073@posting.google.com...

Richard Coners
> Also, I don't understand why Albert makes such a big deal out of
> non−locality. If two particles are in a "non−separable state" where
> the color of A is opposite the color of B (A+B = 0) is the quantum
> state of the two particle system, then non−locality seems to follow
> logically.

Bernard Chaverondier
Your interpretation amounts to the _local_ hidden variables
interpretation of quantum indeterminacy, which has been proven
to be incompatible with the violation of Bell's inequalities.

The famous EPR effect you are evocating involves
two photons in an entangled state of polarization

|psi> = (|0°90°> + |90°0°>)/2^(1/2)

This doesn't mean that the pair of photons can only collapse
in the state |0°90°> (0° polarization for the "local photon"
and 90° polarization for the "far photon")
or in the sate |90°0°> (90° polarization for the "local photon"
and 0° polarization for the "far photon")

This possibility arises if the first polarizer that realizes the
measurement is a 0° polarizer for instance (1)

On the contrary, the pair of photons collapses in the state
of polarization |+45° −45°> or |−45°+45°> if the polarizer
that is the first one to perform the measurment is oriented
at 45° or at −45°.

This proves that the polarization of the "far photon" that stems

from the polarization measurement of the "local photon"
depends on the orientation of the local polarizer.

To be more specific,
* let p+ be the conditional probability that the "far photon" measurement give rise to the same polarization orientation than the far polarizer orientation when the "local photon" has been measured with the same polarization orientation than the local polarizer.

* let p− be the conditional probability that the "far photon" measurement give rise to a polarization orientation orthogonal to its polarizer one when the "local photon" has been measured with the same polarization orientation than the local polarizer.

If the local polarizer (at the moment when local measurement is performed) has same orientation than the far one (at the moment when the far measurement is performed)

then p+ = 0% and p− = 100%

If the local polarizer (when local measurement is performed) is oriented at 45° with regard to the orientation of the far one (when the far measurement is performed)

then p+ = p−=50%

The conditional probability of the polarization outcome of the FAR photon depends on the orientation of the LOCAL polarizer.

This non local effect is even more striking (and easier to grasp) in the case of the Greenberg Horn and Zeilinger thought experiment involving the spin measurements of three entangled spin 1/2 particules.

I don't explain the GHZ thought experiment here for the sake of brievety.

Bernard Chaverondier
http://perso.wanadoo.fr/lebigbang/transformation.htm
Derivation of Lorentz transforms and definition of inertial
systems of coordinates in the framework of Aristotle space−time.
http://perso.wanadoo.fr/lebigbang/epr.htm
Quantum determinism or Relativist locality ?

(1) the possibility to say that one of the two measurements of polarization be the first one relies on a not Lorentz covariant interpretation of EPR experiment which I rather believe to be the correct one. As these measurement are spacelike separated, if we assume Lorentz covariance, ie if we assume quantum indeterminacy to be fundamental, there no possibiolity of instantaneous information transfer hence experimental possibility to say which measurement

has been performed firts