About the double-slit experiment of Dean Radin

M. Pitkänen
Email: matpitka6@gmail.com.
http://tgdtheory.com/.

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Abstract

Dean Radin and his team have carried out an interesting variant of double-slit experiment using laser beam to test the idea that observer induces state function reduction. Wave aspect of photons implies that photons arrive through both slits to the screen, where the absorbed photons give rise to an interference patter. Subject person - either meditator or a person having not practicized meditation - imagines that the photons arriving to the screen arrive through either slit - that is intend to detect through which slit the photon goes. A slight deviation of the interference pattern from that obtained in absence of the subject person emerges in the case of meditators. Second experiment is carried out via net and similar effect is obtained. In this article a TGD explanation for the findings is discussed.

Dean Radin and his team have done a very interesting experiment [J1] (see http://tinyurl.com/h44rns8 and http://tinyurl.com/q7nbxnk) testing the idea that observer induces state function reduction.

1 Experiment

The experiment is a modified double slit experiment (see http://tinyurl.com/94c63cn). In double slit experiment a laser beam arrives to the screen via two slits and interference pattern is generated as if photons would behave like waves localized at screen. If one adds detectors at the slits, either detector fires and detects the passing-by by photon, and interference pattern disappears with optimal detection efficiency.

The idea is to add a subject person (S) at distance of two meters. S imagines of measuring that electron passes through either slit. One can say that S intends to add a "detector" to either slit or both of them so that a state function reduction selecting either slit occurs. This experiment differs from experiments in which S tries to affect the ratio of frequencies of 0:s and 1:s in random series of bits: S does not try to force the electrons to pass by either slit. There is a feedback represented as sound/yellow light whose height/intensity coded for the amount of the reduction of the height of the peak. There are two kinds of participants: meditators and those who have no experience in meditation.

The results of the experiment are thoroughly discussed in the Youtube lecture or Radin (see http://tinyurl.com/h44rns8). To my opinion the results are amazing. In one experiment it was found that the height of the peak of the Fourier transform of the intensity distribution of the diffraction pattern is reduced. In second experiment the depth of bottom of the through of distribution was reduced. As if the intention would induce with some probability to perform the measurement selecting the photon path. The effect was small but appeared systematically for a group consisting of meditators. For persons without experience in meditation the effect averaged out also in this case it was present in the beginning of the experiment when subject person were not bored by the repetitive character of the experiment. The longer attention span of meditators could partially explain this.

Even more amazing finding was that in a variant of the experiment realized in internet the results were also positive although the persons intending to induce the experiment.

The standard argument of skeptic is that statistics is poor, that the experiment is even fraud, etc... One can however consider more refined and more imaginative objections. Let us make a digress from the usual behavior of skeptic and assume that the effect was real.

If the meditators could induce the measurement by intention, one expects that also the experimenter could have done it. To how high degree the outcome was due to the experimenters and how much due to the meditators? Experimenter also had the theoretical expectation that meditators are better in inducing the slit detection. Could the wish that the theory is correct have caused subconscious intention about performing the detection in the case of meditators or not doing it in the case of non-meditating subject persons?

In the case of net experiment situation becomes even more problematic. One can imagine that also in this case the intention of experimenter could induce the detection - at least if experimenter is near to the system. Should experimenters have spent the period of experiments in Mars or at least in a distant holiday resort! Experimenters studying remote mental interactions are usually not rich people and presumably they did not do this.

The experimenter effect is well-known in parapsychology. Some experimenters are extremely successful. Could one think that they have strong intentional powers? Ironically, this would demonstrate the reality of paranormal effects of this kind but in a manner that can never convince the skeptics. There is evidence for this kind of effect in the testing of new medicines. Good results are obtained when the testers are enthusiastic and dream of a positive result. When they do same tests after some years, the results are worse.

2 TGD based model

The challenge is to understand how the S imagining a measurement telling that photon went through either slit could realize this intention. What does the detection mean and what it demands?

1. The measurement should involve a state function reduction selecting between the slits entangled with observer. In principle it is enough to have an interaction of photon in either slit localing the path of the photon to that slit. It is enough that photon interacts with charged particles in either slit with some probability. This measurement is of course not optimal since the interference diagram is only partially changed. Only some fraction of these measurements take place and produce single slit pattern so that the observed pattern is a weighted average of double slit and single slit patterns. In principle one can estimate the probability for single slit pattern from the data.

2. Quantum classical correspondence requires that in order that the intention to detect could be realized, one must have a physical connection from the S to both slits or at least either of them. Also charged particles assignable to the connection should be involved to make scattering of photon possible. Also entanglement entangling detector fires/does not fire with corresponding states of some other system, say the S would be needed.

2.1 Flux tubes as correlates for attention and entanglement

How could one realize these connections in TGD?

1. In TGD framework the magnetic flux tubes serve as correlates of entanglement and directed attention [K3]. To direct attention to a system means to connected with it by flux tubes. Flux tubes carry dark charged particles essential for TGD view about quantum biology.

2. Every system has U-shaped flux tubes emanating from it and acting as kind of tentacles scanning the environment. As a U-shaped flux tube from system A encounters another similar flux tube from system B, a reconnection takes place if the quantized fluxes are same. The outcome is a pair of flux tubes connection A and B. The flux tube pair can carry Cooper pairs with members of the pair at the flux tubes. The photons from laser could scatter from the charged particles.

3. The dark particles the flux tube are dark with $h_{eff}/h = n$ [K1, K2] satisfying an additional condition implying that n is proportional to the mass of the charged particle in turn implying that cyclotron energies $E_c = \hbar_{eff} eB/m$ are universal and assumed to correspond to biophoton energies in the range of visible and UV: bio-photons would result in the phase transition transforming dark photons to ordinary photons.

In order that photon scatters from the charged particles it must have the same value of h_{eff} as the particles at magnetic flux tubes emanating from the S. Some fraction of laser photons could satisfy this condition. Note that if perturbative quantum theory applies, the classical predictions are same as lowest order quantum predictions so that h_{eff} makes it visible only in higher orders assuming that perturbation theory works when $h_{eff}/h = n$ holds true. Unfortunately, it is not possible to estimate the probability that photon enters to the flux tube. Note that the probability depends also on the density of the flux tubes.

2.2 Net experiment

The effect is reported in net experiments for which distances can be long and there is no visual contact. Can one understand this?

1. If there quantum entanglement between A and B already exists one can increase the distance without spoiling the entanglement. But how to achieve the entanglement if n the systems are at large distance from beginning?

2. The length of the magnetic flux tubes is not a problem. The size scale for the layers of magnetic flux tube corresponding to EEG frequency 7.8 Hz is circumference of Earth. The condition that the size of the flux tube is at least of the order of the cyclotron wavelength λ for cyclotron photons at the flux tube implies that length of the flux tube of of the order of the size scale of Earth for EEG frequencies.

   In fact, our MBs could have much larger layers if biological rhythms have cyclotron frequencies as counterparts. The size scales could be of order light-life-time or even longer. This changes totally the view about the role of length scales in biology and consciousness. There is some evidence that galactic day defines the natural rhythm for precognitive phenomena: precognitive phenomena tend to occur at galactic midday. Galactic cyclotron frequencies (the galactic magnetic field is of order nT) could correspond to bio-rhythms up to 12 hours.

In net experiment the problem is how to generate the connection to a correct target. The same problem is encountered in the attempts to explain the claimed results of remote viewing experiments. Could the density of flux tubes of personal magnetic body (MB) be so high that the connection is generated with high enough probability. S receives data through the web. Could this help to build the desired connection.

1. Skeptic would explain the reported positive result in web experiments by saying that the results were actually induced by the intention of the experimenter who was near to the system. This might of course be the case.

2. The first possibility is that an entanglement is generated between the camera monitoring the system and slits involving flux tubes. The communication of the image from the camera to computer builds another flux tube bridge. The radiation reflected in satellite to the computer at Earth involves propagation along flux tubes. At the receiver ends similar bridges are build. There is therefore a flux tube connection with the computer of used by S, who generates the last piece of the connection. This kind of flux tube connection would be between all communicating systems. Also the experiments would belong to this entanglement network.

3. MB has layers with size scale of order Earth size. Could it be able to meet the challenge by using the information coming from web. Could the U-shaped flux tubes be so dense as to be able to build a contact with the experimental arrangement with high enough probability? If they are to represent Maxwellian magnetic field in good approximation, they should be dense. What is important that these flux tubes correspond do different space-time sheets for distinct observers: this is actually the basic distinction between the field concepts of Maxwell and TGD.

   Could it be that the feedback from S at her computer via the net to the computer at the other end generates quantum correlated events and this correlation has as correlates magnetic flux tubes connecting the distant systems.

4. The hyper-imaginate option is that S can delegate the problem with collective consciousness assignable to the magnetosphere of Earth and having all the engineering knowledge that Earth has! Could we be neurons of a gigantic brain of Mother Gaia, which would help S to realize their intention. Can single neuron realize its intention on a distant neuron in brain in the similar manner? Could some kind of resonance mechanism be involved?

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