Proof Idea Retrosignaling with Standard Quantum Physics

Thomas Goßmann
Kassel, Germany
thg1@alice.de

Nov4 2019

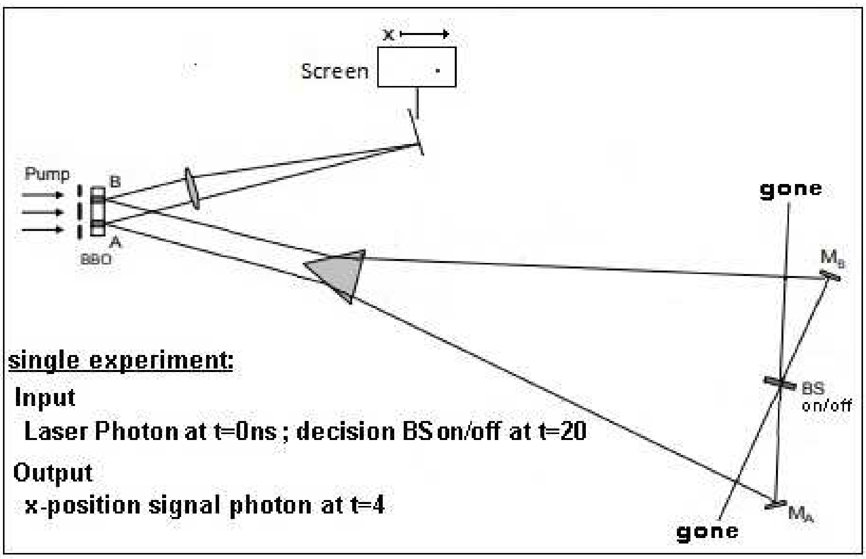
It is accepted that some causality goes backwards in time (retrocorrelation):
When a photon hits a screen after a double slit, the probability of the x-coordinate depends on whether one slit can be identified as having been passed by the photon or not.
This holds even when the fact “slit identifiable“ or “not“ originates after the screen has been hit.

The problem in using this is that the photon impact on the screen does not show its probabilities; from the impact one cannot see if the impact will be influenced later or not.
So the standard talking is “retrocorrelation exists but it can´t be used for retrosignaling“, and some folks even tried to prove this.
I think their proofs are wrong (without having looked at them closely), and here is how to practically use retrocorrelation for retrosignaling:

An array of simultaneous delayed-choice-experiments without coincidence counters is used, then one gets recognisably distinct statistics depending one future decision, which sends one bit into the past.

First, the Kim...Scully experiment from 1982/1999 is modified:
- instant high-precision measurement screen for signal photons instead of going through one x-coordinate after the other with coincidence counters. (I hope 99% accuracy is no problem in mass production.)
- longer light ways
- no idler measurements (possibility is enough to influence probabilities)
- no first line of beamsplitters, decision about interference (= “no slit identifiable“) is made with variable beamsplitter (On: half of photons pass, half reflect; Off: all pass)

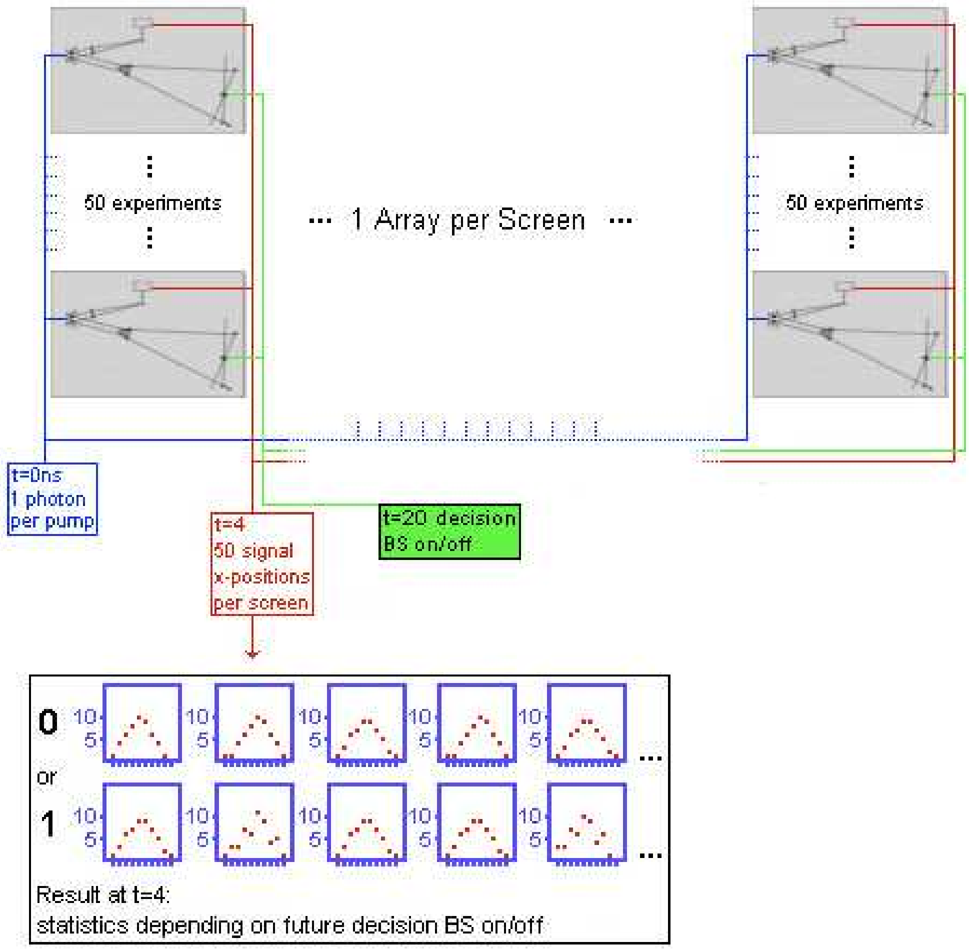
picture1



At t=0 a photon (“pump“) passes a double slit and causes BBO area “A“ or “B“ to emit two entangled photons, one signal to screen (impact at t=4ns) and one idler to BS (passage at t=20). It is not defined, which of the BBO areas is emitting (which slit was passed), unless which-way information is created and measureable. If the BS is on at t=20, the way is not reconstructable. Many runs form a pattern on a summary screen, which sums up many screen impacts. If afterwards sorted by leaving direction of idler (via detector1 and 2 in Scullys experiment, where now the photons go lost), two interference patterns appear, which have a phase shift and sum up to a non-interference pattern. If the BS is off, the way is reconstructable via the same detectors, and the signal summary screen shows two non-interference patterns with phase shift.

Now I combine 50 such experiments in a simultaneous array:
At t=0 50 photons start in 50 of the above arrangements, at t=4 an impact statistics (x-coordinate) appears on a common screen (visualisation screen or place in chip, not measurement screen), at t=20 decision BS on/off is made. [maybe common measurement screen is possible]
The screen shows 50 incident photon impacts (their x-coordinate), with a distribution probability equal sum of two interference probabilities with different weight, depending on how many photons were leaving which way . (With more than 50 photons per run, screen graph gets closer to probability graph.)
In some cases many photons leave the same way, so interference is visible on summary screen. (Leaving upwards or downwards, “gone“ in picture)
Then, very many such arrays are combined in an “array of delayed-choice-arrays“.
So one gets at t=4 a set of summary screens, where many show interference if all BS on at t=20, and few show interference patterns when all BS off.
picture2

Proof Retrosignaling with Standard QM (Array of Delayed-Choice-Arrays)

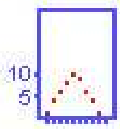
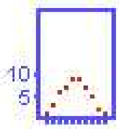
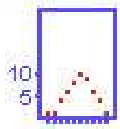


statistics 0:

BS off, all signal photons without interference. The screen shows a mixture of two non-interference statistics.

Average and extreme screens:

BS off, all idlers leave upwards: BS off, 50%up/50%down: BS off, 100% d:

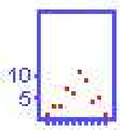
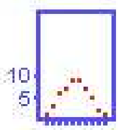
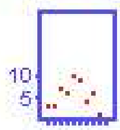




statistics 1:

BS on, all signal photons with interference. The screen shows a mixture of two interference statistics.

Average and extreme screens:

BS on, all idlers leave upwards: BS on, 50%u/50%d: BS on, 100% d:

0 and 1 should be distinguishable within nanoseconds

(That is, decision at t=20 retrosignals one bit to t=4) , proof:

An easy method to check the screen set for 0 or 1 is maybe a gradient analysis:
If an x-position value is lower than the one on its left (on its right on right side of maximum), then the screen-set gradient-number is increased by one. Then 1 has high number and 0 very low.
This is also very fast mechanically. (special chip)

I wonder if the phase shift between the interference curves can be zero, then one screen is sufficient instead of tenthousands or millions. (like “another retrocorrelated process that influences the lens before screen“, no idea yet)
It is hard to work on these experiments, because the literature seems very poor (general problem of physics studies).

Experiments with coincidence counters can check if there had been sent distinguishable statistics 0 or 1 into the past, depending on BS on/off.

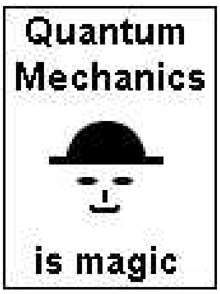
Maybe one should think about “inner photon frame“ as retro-information explanation, and repeat experiment with electrons.

If this is standard QM, what are the time paradox expectation values of QM?

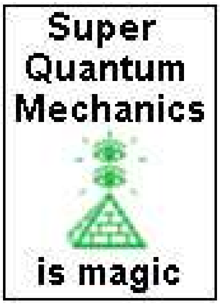
For these experiments, the best general theory available T is something like:
<u>T = QM + RTeffects + “cause first“ not axiom</u>

Super Quantum Mechanics:
I hereby offer to build a “wave changer“. That is a device which replaces the chicks in part 1 (“Draft articles on retrocausality“): If a polarised photon (50%vertically, 50%horizontally) is measured, the result is 80% or more vertically when this device is applied (New Fundamental Force).
Maybe the Chinese Ambassador is now interested to invest in an institute, because was replaced.
The Institute is simultaneously independent and Chinese related, which is a historic philosophical developement.

A physicist at CERN (which is female, so I don´t know the exact pc english title; in german it is a complicated order of letters including special signs, and then in Kassel university they do feministic physics with smiling women and tortured men, and Secret Service) had this poster in her office:



Though I try to prove retrosignaling within common (non-super) QM, the correct poster is probably more like this:



- QM-studies: I try to see particles as localized probability cloud (square of wave function) that interacts with environment before collapse. (A double slit influences the probabilities before measurement.)
Plus every point in the cloud space has an extra factor, which contains the info that was lost by squaring.
I wonder what this factor looks like (complicated, nonlocal, helpful). (Don´t even know yet how the other particle properties come in; insufficient studies because of too much trouble with stupid officals.)

TG

Wikipedia: Delayed-choice quantum eraser

- - - - -

combinatorics, probabilities, gradients
BSon

A single signal impact #n has the x-coordinate-intervall probability $Pn= \int_{x0}^{x1} Roi(x)dx$

with i=1,2 ; Roi normalized Graph from Kim...Scully, detector i . ($\int_{0}^{3} Roi(x)dx :\approx 1$)

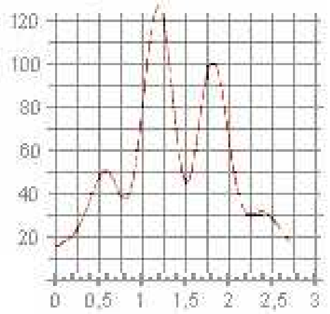
The expected correlation curve for a screen with d D1-events and (50-d) D2-events is:
Sd(x)= (d Ro1(x) + (50-d) Ro2(x))/50

Possible combinations of D1/2 measurements, expected correlation curves of their signals´ x-positions and probabilities:
(possible combinations of 50 Measurements N = 2Exp50 ≈ 1,1x10exp15)
(The dots and y-axis represent the correlation curve, not the experimental results.)

picture3

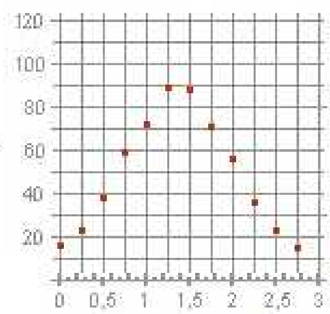
Expected correlation curves for signal screens, depending on idler ratio D1/D2 (BSon)

d=0 100%D2
N(d=0)=$\binom{n}{d}$=1
P(d=0)=1/ 1,1x10exp15
=0,0000000000001%



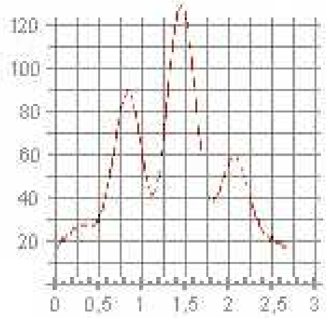
…

d=25 50%D1, 50%D2
N(25)=1,264x10exp14
P(25)=11,5%

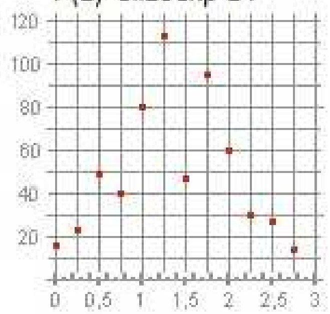


…

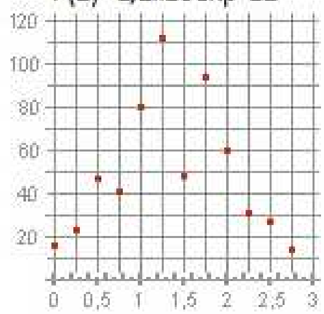
d=50 100%D1
N(50)=1
P(50)=10exp-15



d=1 2%D1, 98%D2
N(1)=50
P(1)=5x10exp-14

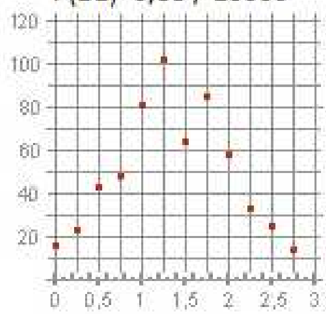


d=2 4%D1, 96%D2
N(2)=1225
P(2)=1,2x10exp-12

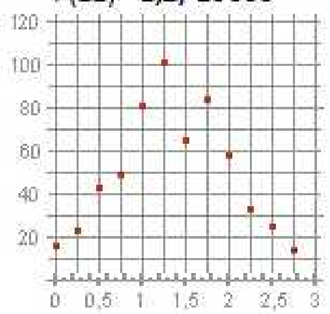


…

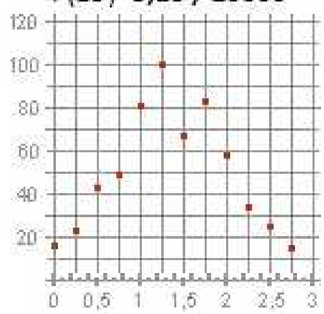
d=11 22%D1, 78%D1
N(11)=3,74x10exp10
P(11)=0,33 / 10000



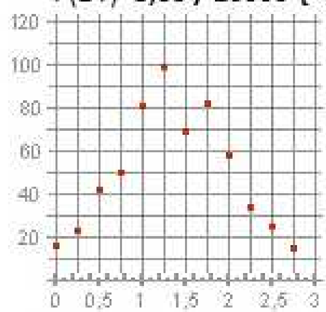
d=12 24%D1, 76%D2
N(12)=1,21x10exp11
P(12)= **1,1 / 10000**



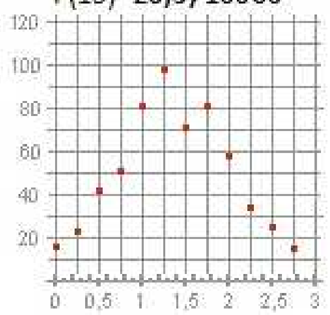
d=13 26%D1, 74%D2
N(13)=3,55x10exp11
P(13)=**3,23 / 10000**



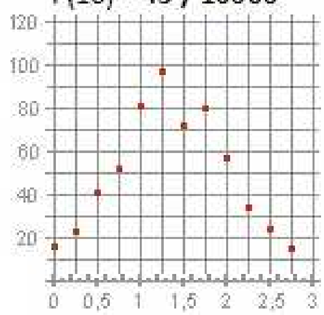
d=14 28%D1, 72%D1
N(14)=9,38x10exp11
P(14)=**8,53 / 10000 [≈1‰]**



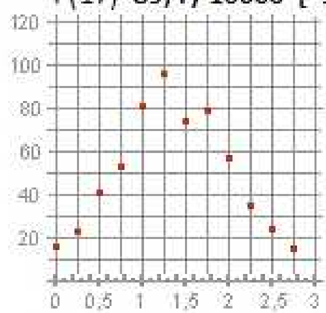
d=15 30%D1, 70%D2
N(15)=2,25x10exp12
P(15)=**20,5 / 10000**



d=16 32%D1, 68%D2
N(16)=4,92x10exp12
P(16)= **45 / 10000**

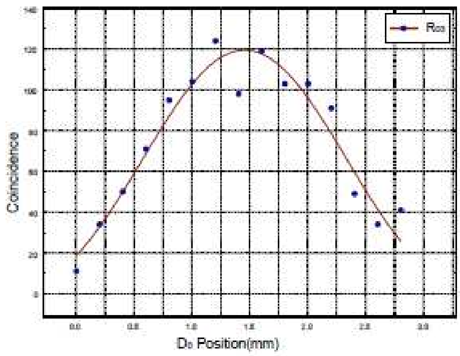


d=17 34%D1, 66%D1
N(17)=9,84x10exp12
P(17)=**89,4 / 10000 [≈1%!]**



…

I don´t see how the BSoff screen-set can have as much interference.
This looks like a situation where a proof is possible, that the above gradient analysis is 99,99% successful, depending on no. of photons per run, x-coordinate interval, no. of arrays.
On the original 1999 screen with hundreds of coincidence counts, one of the two BSoff graphs is shown (correlation/expectation curve + measurement results). The dots are not very close to the expectation curve, fake maxima appear:



So maybe 1000 photons per array and 1000 arrays are neccessary.
The gradient analysis proof, with 0/1 prediction accuracy depending on photon no. per array, no. of arrays, size of x-coordinate intervals and measurement precision, will take a while and I should be paid for it.