THE HUMAN PERCEPTION AND UNCERTAINTY IN QUANTUM PHYSICS

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The uncertainty of world is being considered by human perception point of view. So the knowledge is shared on usual, unusual, transcendent and transcendental. It depends on what kind of world (macro or micro) and in which position the observer exsists (in or out system), i.e. system is open or closed. For the analysis of this problem the "Schrödinger cat" experiment has been considered.

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1. INTRODUCTION

Objects are the sources of the information and it is clear that the quantity of the information depends on number of objects perceived by man. The macrocosm is perceived directly, and a microcosm through the device. However, through the device it will be very smaller number of objects and consequently the information will be much less. Therefore, the perception of an invisible microcosm is not complete. Perhaps, real reason of Heisenberg Uncertainties is in it.

Let's N_k and N_q are the numbers of perceived objects in a macrocosm (the classical world) and a microcosm (the quantum world), accordingly. It is clear that uncertainty is inversely to the number of perceived objects, and we can enter unit of uncertainty that will be $\Delta\alpha_k = \frac{A}{N_k}$ and $\Delta\alpha_q = \frac{A}{N_q}$ in a macro and microcosms, respectively, where A is a constant connected with human ability of perception. Due to $N_k >> N_q$, a microcosm is more uncertain than a macrocosm. We assume that N_k and N_q are constant.

Making observation (aim-directed perception), we perceive not all objects but only those that have been selected. Let's mark them n_k and n_q. It is clear that total uncertainty α is proportional to the number of objects which stay out of our perception, i.e. $(N_k - n_k)$ and $(N_q - n_q)$, respectively. Therefore $\alpha_k = (N_k - n_k)\Delta\alpha_k = (N_k - n_k)\frac{A}{N_k}$ and $\alpha_q = (N_q - n_q)\Delta\alpha_q = (N_q - n_q)\frac{A}{N_q}$ in macro and microcosms, respectively.

Let's consider a case, when in both worlds the uncertainty is the same, i.e. $\alpha_к = \alpha_q$. In the only measuring process this case can take place because there is no border between macro- and micro worlds and a man acts in "macrocosm + microcosm" system. His consciousness can be either included (closed system) or not included into this system (open system). When the system is opened, the microcosm's uncertainty is decreased and becomes equal to the uncertainty of a macrocosm. When system is closed the closed system, on the contrary, the uncertainty of a macrocosm is increasing and becomes equal to uncertainty of a microcosm. So, from $\alpha_к = \alpha_q$, we obtain $n_q = \frac{N_q}{N_k} n_k$. One can see that the increasing of number of observed objects in micro world lead to the increasing of this that in macrocosm. It means that the some other macroscopic device, becoming already observed objects, can give us additional information about quantum world. Let's try to see this correlation in the well known Einstein - Podolsky – Rosen (EPR) paradox [1]. In this paradox, two particles that interact with each other sometime are considered. They appear in entangled, or it is better to tell in connected because by the measurement of an impulse of only one of particles it is possible to predict an impulse of other particle. But it means the number of the observed objects in quantum world is increasing. Without doing special supervision or measurement, we nevertheless receive the additional information. Bohr has explained this paradox by a certain configuration of devices [2]. Namely the configuration of devices gives increasing the number of observed in macro world (this is that device becoming observed object) in a result of which we receive the additional information about a microcosm. As Bohr writes that in each experimental installation it is necessary to establish the border between those parts of physical system that we consider as measuring devices and as objects of researching. It depends from us. Bohr himself chooses this border such way as he writes: «the choice of a place for this border is possible only within that area where the quantum-mechanical description of the given process in essence is equivalent to the classical description». So Bohr can avoid this paradox. Thus, in quantum physics all depends on the choice of border. The choice of this border will be made by the observer who should not be included in the "macrocosm + microcosm" system. Such system is opened. But what will occur, if the observer will be included in this system? In this case the "macrocosm + microcosm + observer's consciousness" system, which is already closed, takes place. It is clear that already nobody will be busy by the choice of the border and consequently the question

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about border loses meaning.

Thus, at a certain configuration of devices, the abovementioned observer not included in system could receive the additional information about microcosm; therefore the uncertainty of the quantum world was decreased. In this case, the microcosm becomes such uncertain (i.e.less), as a macrocosm. But if the observer will be included in system then all will be another. For such observer the macrocosm becomes such uncertain (i.e.more), as a microcosm. In two cases $\alpha\kappa = aq$. They differ from each other by the decreasing α in first case (opened system) and the increasing α in second case (closed system). Thus, both Einstein and Bohr are right. They both say about the measurement ($\alpha\kappa = aq$), but different cases are considered by them. Bohr sees in EPR paradox the decreasing uncertainty, which allow us to describe the microcosm by classical method, by theory of probabilities. But Einstein, opposite, sees in EPR paradox the increasing uncertainty and therefore, he say about the latent parameters of sub quantum world. For the deep understanding of all aforesaid the idea of «Schrödinger cat» can be very useful [3]. In this experiment the unusual state of atom, simultaneously being decayed and not being decayed, becomes connected not with atom, as in EPR paradox, but with macroscopic object, a cat in the invisible camera. There is an interaction of these two objects from the different worlds (atom - micro, cat - macro). As result, the paradox – entanglement or joining states of atom and cat with each other takes place. The logic of quantum physics demands us to think that cat is simultaneously both alive and dead. In open system this paradox is resolved by opening camera by observer. He sees that, for example, the cat is alive. This phenomenon is the decoherence. When the camera is closed Bohr's border can pass only in front of the camera. There is no information about states of both cat and atom. But in the case when the camera is being opened this border can already pass inside the camera been occupying the cat. We receive the information about state of the cat (alive or dead). According to its state (cat becomes the device for us) we get information about state of the atom (decay or not decay). Let's note for this atom we don't make additional measurement. Someone can say us that this is different things - two atoms in EPR paradox and atom and cat in Shrodinger's paradox Hypothetically, it is possible another scenario too. The camera is being opened and the Bohr's border is already occupied atom instead of cat. Atom becomes as device for us and we get information about cat. The atom becomes here as object of macrocosm but cat, as atom in EPR paradox, become object of microcosm. In any case, if camera is being opened the uncertainty of microcosm is decreasing and can becomes equal to the uncertainty of macrocosm, i.e. $\alpha k = \alpha q$. Then we can by state our macroscopic cat-device we can judge about atom. In fact, in only this case Bohr was right to use the classical knowledge. All these - opening the camera, looking on it and choosing border - will be done by observer, i.e. his consciousness that is outside "macrocosm + microcosm" system, i.e. in open system.

In the closed system already, absolutely other picture takes place. There is nobody to open the camera and make decision about Bohr's border. Consequently, there is no decoherence. The Schrödinger's cat becomes as object of a microcosm. Therefore the uncertainty in a macrocosm is increasing and can becomes equal to the uncertainty of a microcosm, i.e. again $\alpha_k = a_q$. In this case already Einstein will be right.

2. DEPENDENCE OF PHYSICAL EXPERIMENT ON STATE OFCONSCIOUSNESS

The knowledge is the product of human brain. The consciousness is property of brain and therefore it participates in origin of knowledge. Clearly, that this participation may be either active, i.e. influencing on origin of knowledge, or passive. Really, in the philosophy there are different kinds and levels of consciousness and scientific knowledge which due to various forms and levels of reflection of objective characteristics of the reality in consciousness of the human. Clearly, that the consciousness is passive, if it is not included in system, system in this case is open. And the consciousness can be active if it is included in system, system in this case closed. Activity or passivity of consciousness is expressed in its ability of influence on reflection of reality, i.e. on knowledge. Having written the active consciousness may influence on reflection of reality it is possible to imply this influence can be directed on reality itself too. Whether so it actually we can not say. But we know the fact that the closed system should differ from open. This difference it is expressed in activity of consciousness which influences reflection and on knowledge. But what reality is being reflected in human consciousness - macro or micro world? It is clear due to percept the reflection of macro world (complete)is one-valued, but the reflection of microcosm (incomplete) - multiple-valued one. Thus in open macro world, i.e. consciousness is a passive, the reflection is an one-valued, the knowledge is an usual - this is the classical physics. In open micro world, i.e. consciousness is a passive, but the reflection is a multi-valued, the knowledge is an unusual - this is the quantum physics. But what will it be in closed system? In close macro world, i.e. consciousness is an active, the reflection is an one-valued, the knowledge is an transcendental - this is the more full scientific knowledge will be getting by us by epistemological analyses. In closed micro world, i.e. consciousness is an active, the reflection is multi-valued, the knowledge is an transiently - this is Kant's theoretical knowledge that by his definition never can be get by us [8]. It concerns to Einstein sub quantum world with its latent parameters too. The physical realities for these cases are known in philosophy as usual, ontological and active [9].

Let's imagine an usual mirror. It is the consciousness of human. The mirror is passive,

because reflection of subjects in it does not depend on itself. Similarly the consciousness is passive, if reflection of reality in it do not depend on itself. Clearly, this passive consciousness is the consciousness in open system, because only in this case the consciousness is similar to a mirror can be counter posed to the being. If around of a mirror there is bright light, for example the sunlight, the reflection of subjects in it will be unequivocal. Clearly, the perception of these subjects will be complete. This case of bright light around of a mirror corresponds to a case of a macrocosm. Really, the macrocosm is the visible world for us. But now we shall imagine, that the mirror is in darkness. Clearly, any image is absent in a mirror This case of full darkness around of a mirror corresponds to a case of a microcosm. Really, the microcosm is the invisible world for us. But we want to receive though any image in a mirror. For this purpose, we artificially illuminate a subject by lamp. This action corresponds to how we investigate a microcosm with the help of devices. Artificial illumination will not be very bright; therefore reflection of subjects in a mirror will not be precise but will be multi - valued. Similarly, the human perception can not be complete in this case. As a result the knowledge can not give us unequivocal precise picture of world. Really, Heisenberg Uncertainties of a microcosm are the proof. The knowledge from these uncertainties is multiple-valued because it is impossible to tell exactly about localization and speed of a micro particle. So, the usual mirror corresponds to passive consciousness. But what mirror will correspond to active consciousness? In this case system is closed and the mirror should be unusual. Such mirrow is the false mirror, the reflection of subjects in it depends on itself. To receive false mirror the person makes the act - alters a usual mirror. For this action he should be included in system. Similarly to this action of the person, the consciousness, included in system, can change consciousness, and reflection in it of a reality will depend on it. Therefore the knowledge, being this reflection, will depend on the consciousness. In this case, the consciousness influences on process of an origin of knowledge. As imagines it by phenomenology, reflection of the objective reality will be already actually a stream of consciousness.

3. THE PARADOX OF " SCHRÖDINGER'S CAT"

It is known, in a macrocosm the some body can be only in one state. Clearly, this knowledge is the usual. In a microcosm the elementary particle can be simultaneously in both states. Of course, such knowledge is the unusual.

The cat's paradox was needed for Schrödinger to show us that unusual phenomena of micro world can transit to macro world due to effect of increasing. Therefore in a macrocosm there is a unusual knowledge too. The Schrödinger's cat paradox, both alive and dead at the same, is being resolved if man looks at inside of the camera, i.e. it depends on consciousness of the observer. Thus, the consciousness becomes object of quantum physics. Thus on the question: «Where border between macrocosm and microcosm?» it is possible to answer that this border depends on the perception (consciousness) of man. Though we speak about macro object - about a cat - but, it is connected to a microcosm, it is a microcosm until the person doesn't open the camera. The state of Schrödinger cat of simultaneously both alive and dead corresponds to open microcosm. As soon as man look at cat the state of a cat become at once determined, for example alive cat. Such state of a cat corresponds to an open macrocosm - to the world that we see, in which we live. One and the same Shrodinger's cat, but two kind of knowledge about its state – usual and unusual. Unusual knowledge, simultaneously both alive and dead cat, concerns to the entangled state.

In open system the paradox of Schrödinger cat is solved by the decoherence phenomenon [4], i.e. open the camera and find out, that the cat, for example, is alive. Schrodinger magic cat becomes normal cat. As it is explained by Menskii [3] there are some degrees of freedom, including also a brain, i.e. consciousness of the observer that at our measurements gives us the information, for example about Schrodinger cat. Having already statistical ensemble of normal cats, we can use probability theory and do the statistical forecast.

But what is happen with the Schrödinger cat in the closed system? Nobody open camera to look at cat. Is there theory to help us to resolve this paradox? The most interesting theory is the many-world interpretation of quantum mechanics by Everett-Wheeler [5] The closed system is all world, including the observer too. Everyone of a component of superposition describes the whole world, and any of them has not advantage. The question here is not: "What result of measurement will take place?" The question here is: "In what world from many worlds does the observer appear?" In the Everett-Wheeler's theory it depends on consciousness of the observer. Wheeler calls such consciousness "active". The knowledge in this case is knowledge of active consciousness and it is either an transcendental (such name for this knowledge was given by Kant due to possibilities to reach it) in open system or an trancient (that due to not any possibilities to reach it) in close system.

Let's remember Einstein's quote: «God doesn't play bones with the universe». Menskii M.B. writes in his article [6]: «Yes, the God does not play bones. He equally accepts all opportunities. In a bone plays consciousness of each observer». The author means, that the consciousness of the person, his mind builds the future forecasts, basing on concepts of probability theory. Let us agree, that the world about which speaks Einstein in which the God does not play a bone is the real world. The world in which the human consciousness plays bones is our sensual world. Nevertheless, as wrote Plank [6] besides these two worlds there is also the third world - the world of a physical science or the physical picture of world. This

world is the bridge for us with its help we learn worlds. This world show us the physical reality. Display of the real and sensual worlds in itis the quantum and classical worlds, accordingly.

In physics the classical world is often interpreted, as the objective world but the quantum world exists, as some mathematical image - a vector of a state, i.e. the wave function. Therefore it is not objectively existing world. Such interpretation as says Plank [7], can result in opinion that there is only sensual world and this mistaken opinion cannot be denied by logic way. Because logic itself can not pull out someone from his own sensual world. Plank notes, that besides logic exists also common sense from point of view of which, the interpretation of mutual relation of the worlds will be absolutely another. Namely, the quantum world is the objective world; the classical world is the illusion. However, it is possible to extend this interpretation of the worlds and look on it in anew. As we saw above, in the Schrodinger cat experiment the border between quantum and classical worlds is erased. Therefore, the real world is both objective quantum world and objective classical world. The sensual world is both an illusion of the quantum world and illusion of the classical world. Thus, both quantum and classical worlds consist of components - objective one and illusory. However, can an objective classical world and illusion of the quantum world exist for our perception? The classical world is the world of macroscopic objects and our consciousness sees, perceives this world. This world for us must be sensual world. Illusion of the classical world satisfies to this condition. The quantum world is the world of microscopic objects. This world invisible to us can not be the sensual world. The objective quantum world satisfies to this condition. Thus, though there are both an objective classical world and illusion of the quantum world, but for us they are outside of a field of our consciousness. One can understand why classical and quantum physics differ from each other. The classical physics is the science studying physical picture of illusion of the classical world. Quantum physics - the science studying physical picture of the objective quantum world.

So, our consciousness has deal the objective quantum world. Menskii M.B.[3] has symbolically represented it as some complex volumetric figure. One of its projections is illusion of the classical world. One can say this complex volumetric figure is a simplex. This simplex is the physical picture of world for us.

4. SIMPLEX INTERPRETATION OF QUANTUM PHYSICS

As it is well known from the functional analysis [10] that one point is 0-dimensional simplex, a line segment is 1-, an triangle is 2-, a tetrahedron is 3-dimensional simplexes. The 3- simplex - the tetrahedron - has four 2-simplex (triangles), six 1-simpex (line segments or edges) and four 0-dimensional simplex (points). The sum of all sides equals to 14. It is impossible to imagine a four-dimensional simplex in perceived by us three-dimensional space. The parallelepiped or cube are not a simplex because for this purpose it is necessary that all 8 points were in six-measured space. Thus, simplex formed by more than four points is already complex volumetric figure.

How can one use simplex for our aim? For example, the tetrahedron (fig.1).

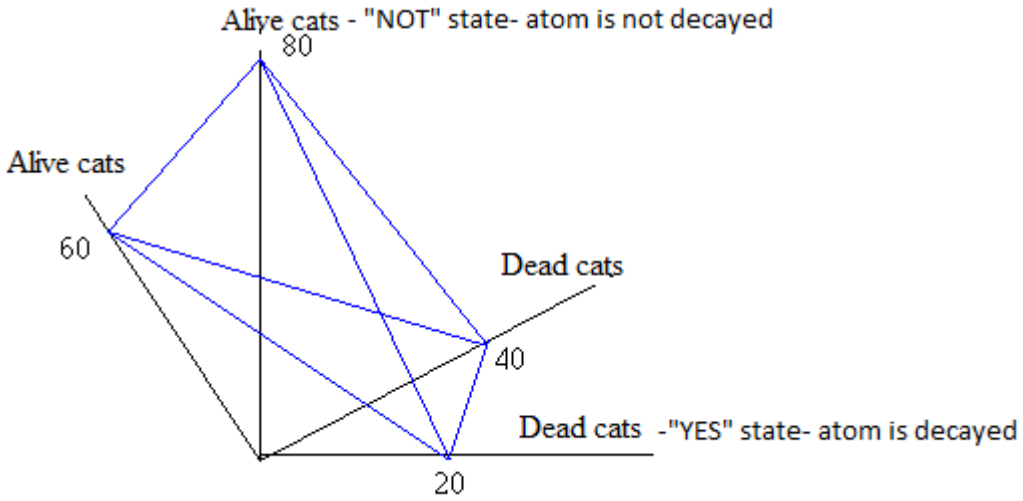

Fig.1. Tetrahedron.

Let's assume its tops are the "events". For example, from 100 schrödinger cats, 80 cats are alive and 20 are dead. Points 20 and 80 are two tops of a simplex. In another case from 100 cats 60 are alive and 40 are dead. These two points are other tops of a simplex. The edges of our tetrahedron indicate to various probabilities. The edge (80 alive and 20 dead cats) point out the probability of live is egual 80/100=0,8, the edge (60 alive and 20 dead cats) shows the probability equals to 60/80=0,75 and etc. The edge linking the points of 20 dead and 40 dead cats and the rib linking the points of 80 alive and 60

alive cats point out probability that is equal 1. Let's consider the faces of our tetrahedron. On one of them the probability changes from 2/3 to 0,8 ; on another face – from 0,75 to 0,6; on third - from 2/3 up to 0,6; on fourth – from 3/4 to 0,8 etc. As to points of a tetrahedron, they specify determinism of event. For example, the point of 80 alive cats specifies that in fact all 80 cats are alive. Thus, the hierarchy of uncertainties is lining up as determinism in event (point of simplex), probability in events (edge of simplex) and fuzziness in events (face of simplex). Here it is appear the conception of fuzziness of event. Lutfi Zadeh's theory of fuzzy sets gives us possibility to consider events with more degree uncertainties. It can suitable for us because foundation of quantum physics itself deals with Heizenberg's Uncertainties. If one "probabilistic" edge of simplex - line segment in tetrahedron - give us only one state of cat, then one "fuzzy" face of simplex - triangle in tetrahedron - give us sets states of cat in one and the same moment of time. Does not it look like on Heizenberg's Uncertainties? Its $\Delta E \Delta t > h$ demands us to consider the sets of energy states instead of one state as it being made in classical mechanics. In classical mechanics, one state is either one scalar or one vector, in quantum physics that is matrix of those.

We were able to construct this simplex with various deterministic points, probabilistic line segments and fuzzy faces because we were observers from outside of. Only such way we can build a physical picture of the real world. The physical picture of the sensual world is not be already as 3 - simplex tetrahedron but it is only point or line segment because we can sensually perceive only projection of simplex - both points and line segments. The point give determined event. For line segment we use the classical probability. In future, although we use probability for triangle face, but only 0- and 1-simplexles deal with the sensual world. But they are illusion because they are not unique, there are set of the worlds alternative points and segments simplex as one whole. Simplex is one whole, we have not able to perceive its whole. In order to perceive simplex as whole it is necessary to change our perception of time. In sensual world the time is perceived by us as moments our life. But in quantum world is the time be as ours and in generally speaking, does quantum world need conception of time?

It is clear, in the physical picture of the real world the Bohr's probabilistic interpretation of the quantum mechanics is true. Although it is called probabilistic interpretation, but it deals with fuzzy faces of simplex. However, will it be right in real world itself? May be Einstein was right when he said «the God does not play bones with universe». Really, for simplex in whole Einstein is right, he is right in the real and sensual worlds. However, in physical pictire of real world, for projection of simplex as triangle Bohr was right to apply conception of probability well as we apply probability for projection of simplex as points and line segments, i.e. in a physical picture of sensual world. Having a physical picture of the world, we can even count number of all parallel worlds. As our world is three-dimensional and our consciousness exists in it we can count only sides of a three-dimensional simplex - a tetrahedron. As it has been shown above, these sides are only 14.

Usually «game in a bone» we mean only the act of throwing of a bone. However game in bones consists of acts of before (we forecast) and after (realization of one forecast). This situation can be identified to a situation on court; there is a hearing an affair, a verdict and process after a verdict. In the physical picture of a real world, game in a bone by consciousness is a game up to the act of throwing of a bone. Our consciousness can only imagine all sides of a three-dimensional simplex, i.e. all alternative results. But the choice of one of them depends on "active" consciousness. In our sensual world, in the act of throwing of a bone, we shall see this choice. In the physical picture of the sensual world, game in a bone by consciousness is a game after the act of throwing of a bone. Having these outcomes allow giving us the statistical forecast.

Thus, uncertainty of the real world qualitatively differs from uncertainty of the sensual world. It is possible to tell, that uncertainty of the sensual world is not present and as a matter of fact, the finding of probability of some casual event has no affair with uncertainty. Perhaps Laplace's demon would say that in the world there is not probabilities, in the world all things are deterministic. The reasons lead to consequences. Here, the probabilities exist for human due to unknowingness. May be he would add that it takes place in your world - in visible and perceived - illusion and sensual one. However, in the real world there is uncertainty and it is principally. Its source is not your unknowingness. Its source is indeterminism itself. It becomes clear, why the quantum statistics essentially differs from classical.

This simplex with various probabilistic ribs and sides we could construct with the help of the epistemological analysis. The knowledge which was analyzed in this case is knowledge of active consciousness. In the case, when the simplex from a volumetric figure is converted into one of its projection, we see only one of its sides (a point, a piece, a triangle). The knowledge appropriate to this case is the knowledge of passive consciousness. In a simplex the pieces (80,20) and (60,40)where a points 80, 60 are alive, and 20,40 are dead cats, correspond to usual knowledge. In this case we use classical statistics (after we have looked in the camera, Schrödinger cats became simple cats, and we already have data, that, for example, from 100 cats in one case 80 alive, and in the other case - 60 and et cetera) With help of this data we find an average and dispersion of a random variable.

But now the ensemble consists not of simple cats, but Schrödinger cats , i.e. we want to tell, that we deal with a microcosm, with the world, the perception of which, as we spoke, is multiple-valued. In this case, for example, the point 80 is fixed already simultaneously and with a point 20, and with a point 40. Therefore the triangle (20,80,40) is examined. Precisely also the triangle (40,60,20) is considered.

These triangles correspond to *unusual* knowledge. In this case we can not apply classical statistics any more. Therefore we use quantum statistics.

There is a question: «But what in a simplex will correspond to transcendental and tranciently knowledges?» It is possible to tell, the transcendental knowledge - the knowledge of active consciousness in case of a macrocosm - corresponds all simplex. If transcendental knowledge can be received by us a priori (because we could construct the simplex), but for transiently knowledge it is not possible. As we spoke above, the knowledge of active consciousness appropriate to transition from a microcosm in macrocosm, i.e. to our world will be transcendental, and from a microcosm in a microcosm it will be trancient. Really, there is no sharp border between macroworld and microcosms, but in fact there is sharp border between knowledge about them.

5. THE SENSE OF α AND ITS CONNECTION WITH WAVE NUMBER *k*

In [16] it has been established the connection this **α** with the wave function in quantum physics. It has been non-uniform differential equation, uniform of which is well- known Shrodinger equation. ReallyBut now it is interesting to understand deeper sence of **α**. So, the unit of uncertainty α related with the unusual, transcendental and trancient knowledge are $\Delta\alpha_k = \frac{A}{N_k}$ and $\Delta\alpha_q = \frac{A}{N_q}$, where A is constant connected with the physiology ability of man to perceive the world around. Because of $N_k >> N_q$, the quantum world is more uncertain than classical world. Schematically it can be presented as number of lines in fig.2. The more *N*, the more number of states which presented by lines or rays. In [9] Svinger images cells instead of our rays.

Perhaps, we can say that considered by us perception and uncertainty α is connected with the Heisenberg Uncertainties. As Wigner has written that the Plank constant is connected with our perception of world. We have said that A is the constant connected with the physiology ability of man to perceive the world around. As it is known the inequality $\Delta k\Delta x \geq 2\pi$ is the result of Heisenberg Uncertainties. Considering minimum number of oscillations, i.e. oscillations of only one kind we account that it is single unit in a phase space (k,x), i.e. $1 = \frac{\Delta k \Delta x}{2\pi}$. It is clear in the quantum world due to the uncertainty of this world the oscillations must be many kinds and therefore $\Delta k\Delta x \geq 2\pi$. As well similarly this inequality if we consider the number of non observed objects $\Delta n = N_k - n$ equaled to 1, i.e. $1 = \frac{\alpha}{\Delta\alpha} = \frac{\alpha N}{A}$. So, $\alpha N = A$. It is clear that in the quantum world the number of non observed is more than 1. Therefore,

$\alpha N \geq A$ in quantum world and

$\alpha N \leq A$ in classical world.

These inequalities say us about limited possibility of human perception. In quantum world there is no exact knowledge or information because if $\Delta\alpha = 0$ then $N \to \infty$ what is not correspond to quantum world. It is not possible the measurement of only one state of system.

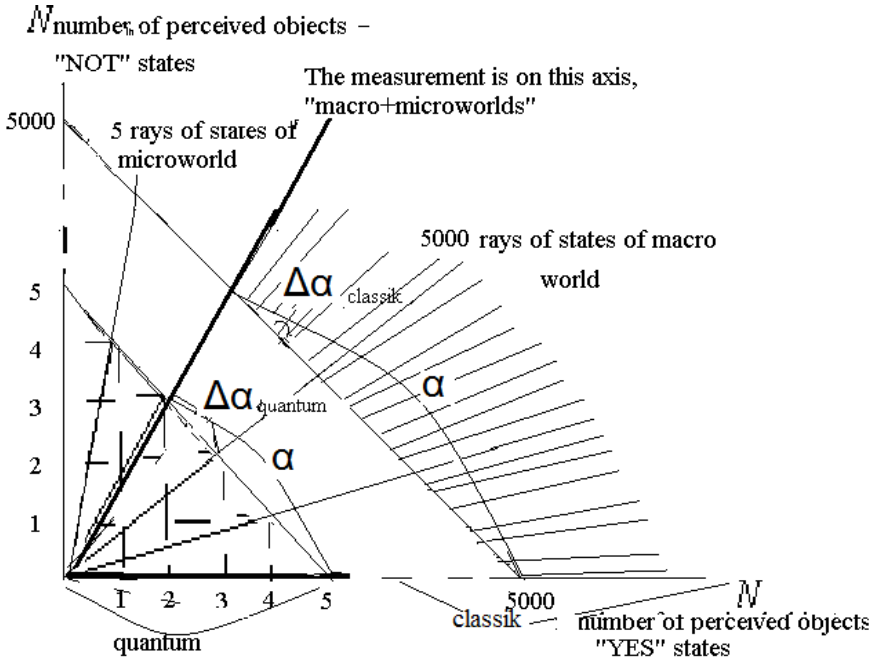

Fig.2. The dependence of the unit of uncertainty Δα on the number of perceived objects N, for example N=5 for micro-, N=5000 for macroworlds.

Swinger [5] thinks that fact of measurement is a result selection of event u from set of other possible realization of the physical magnitude U. There is a diaphragm D closing number of state accessible for registration by analyzer A. Analyzer A is connected with the constant connected with the physiology ability of man, i.e. with our A. The diaphragm D is the field between lines in our figure. Obviously, the more N the smaller field between lines. Therefore, here it is not necessary to include the diaphragm D. The transition from microworld to macroworld is a diaphragm. If $N \to \infty$ then, as Swinger think, all cells are overlapped by diaphragm. On our figure there is no field between lines and, in a results, only one line remains. Therefore, one exact measurement of physical magnitude takes place. Swinger designates such measurement by symbol 0 and he call it by extremely selective measurement. Then the symbol 1 means the extremely nonselective measurements. Having these two symbols of measurements Swinger introduces operations of sum and multiplication that have algebraic properties, i.e. 1x1=1, 0x0=0, 1x0=0x1=0, 1+0=1. In these operations one can see that first operations 1x1is the operation in microcosm and the second operation 0x0 is the operations in the macrocosm. In usual computer the operation 0x0 can take place. Namely third and fourth operations, 1x0=0x1 and 1+0 are operations in the micro world well as macro world. Only these two last operations can take place at creating the quantum computer.

As we can see/from this figure 2, the measurement of same state of objects being in the classical quantum worlds is thin black line of “micro+macroworlds”. Many lines near this line in only macro world point on not discret in our measurements in differ from quantum world, where these lines absent and our measurements already is discretes.

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