

Wave Signal Theory - On the nature of particle

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Over one century ago the double slit experiment presented science with a mystique riddle. The Bose-Einstein condensate (BEC) not only confirmed Young's opinion that light has a wave character, but also described a fifth state of matter in which matter transforms into a wave. But the double slit has a profound secret. It reveals the illusion of wave-particle duality by taking a closer look at the behavior of particles send through the double-slit apparatus. It turns out that the wavefunction rather describes the mutual play between particles and their own electromagnetic fields. This paper will not only question wave-particle dualism and quantum physics, but also the validity of a handful of physical theories.

Solid, liquid, gas and plasma are states dependent on temperature. BEC gave account to a fifth quantum state where matter exhibits the behavior of a wave. It was assumed that matter turns into a concrete wave. BEC was originally derived by Bose from Planck's law which dealt with the spectral density of electromagnetic radiation. Intensity is nothing but statistical frequency of particles summed up. And so what rather happens is that variations in time said to be indistinguishable are transformed into an analog waveform which can be imaged on a screen as impacts of particles. BEC characterizes a signal which can be decomposed into discrete frequencies, a statistical signal processing where the wave-function gets treated as if it is a state of matter.

Thomas Young's wave theory (Rothman, 2003) and the postulate BEC made confirmed each other. The De Broglie-Bohm theory tried to offer an alternative mechanical explanation. However not only is the empirical content the same, but the theory also uses the same mathematical formalism. The only difference is the deterministic metaphysics of the theory which aims to replace quantum mechanics by classical mechanics (Albert, 1992). The De Broglie-Bohm theory is based on a coherent statistical wavefunction too. That is why it fails to predict changes in position of X or Y coordinates. Newer studies (Steinberg et. al, 2011) on the topic of De Broglie-Bohm theory never extended the idea of pilot wave theory nor did they consider what leads to the problem of Heisenberg uncertainty principle. It seems to be believed that developing more subtle measuring instruments will bring the solution. The issue never was a technical one.

The double slit experiment and behavior of particles

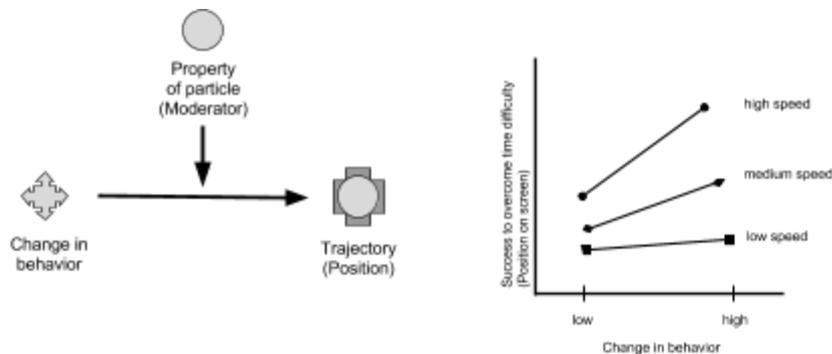
The double slit experiment is an experiment in which the number of possible doorways a particle can take are controlled. In this experiment, researchers can open either one or two slits. When one slit is open the wave's pattern consists of one single bright stripe, whereas when both slits are open an interference pattern occurs. Young compared the wave's pattern to the motion of water moving through two slits. But this does not explain why - if matter is in a state of wave - the way the wave collapses is randomly distributed. One can assume that it is stochastic and unpredictable, but unpredictability is very often dependent from the viewpoint of the onlooker (Gray & Davisson, 2004). The main problem is that the wave pattern on the screen is compared to water waves which attracts the whole attention. Yet a statistical wave cannot be a concrete object itself, but is a mathematical object to describe properties of concrete objects or forces. The wavefunction consists of Gaussian wave packets describing frequency of impacts of particles which are already naturally sorted. This phenomenon of natural organization is indeed caused by the interference of the wave. It leads to metrical organization and a natural ordinal scale. Each packet of the wavefunction can be seen as a natural histogram where properties are naturally scaled and divided into classes. Each class is a normal distribution. If the peak gets handled as a normal distribution of a class then the peaks represent classes of particles with certain average behavior and variances for each class. The only thinkable solution in this case is that particles and waves must be two different components of matter. If the wave is a component of the particle it is thinkable that it gets produced by the particle since it is influencing the trajectories of the particle. It must be send out as a pulsating signal, an electromagnetic wave preparing the way for the particle. Properties of the particle then again moderate changes in flight behavior. Variances in each peak can be caused by systematic and unsystematic inner and outer influences resulting in a noise biasing the outcome whereas outer influences leading to shifts in x and y are not the same. But inner and outer influences usually occur at the same time (Bühner, 2011). As far as they are not controllable in further experiments they must be assumed as inseparable. Since the conditions of the experiment are constant the outcome follows a certain distribution. Outcomes corresponding to 'true' properties will be more frequent than those which do not (Rentzsch & Schütz, 2009). The peaks can therefore be compared with an experimental situation with repeated measurement. The behavior of each particle is a response pattern in response to different conditions. The observed measurement consists of a true score (x) and error (Δx):

$$x_E = x \pm \Delta x$$
$$y_E = x \pm \Delta y$$

This axiom starts from the premise, that there is indeed a property of the particle finding expression in different variations for each peak. In addition, it has to be assumed that the observed value really measures something (per fiat). If combining x and y a bivariate normal

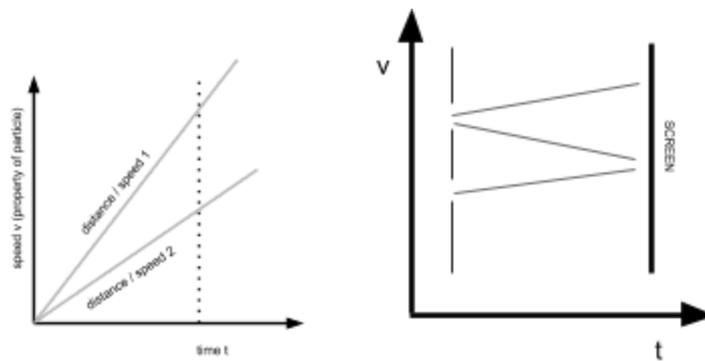
distribution occurs for each peak. However it has to be added, that nature does not know error but just variations. Variances are disturbing the unambiguousness. Variations are an essential component of diversity of human qualia. It is this what represents for example different shades of colors.

Particles are modified to be homogenous before shot. Therefore there seems to be no difference in particles. Yet differences in a latent property of the particle definitely lead to changes in flight behavior. In order to understand this some detective work was necessary. Qualitative reflection about particle, wave and property as the moderating variable predominate at this point theoretical reflections and are estimated according to the peaks. Reflexivity and pre-conceptions in which awareness for certain possible dynamics arises are in fact an essential part at this point.



The trajectories reveal differences in distances. A particle is moving through the interference taking a path that correlates with the latent property moderating the outcome. The interference pattern can be best explained as a network of knots. The knots represent the interferences and the links between the knots are possible trajectories. A particle is moving through the network taking the fastest way because it gets attracted by the closest knot. The waves is moving with a constant speed. So the difference in property must be responsible for changes in the amount of time a particle needs through the interference pattern. In the example of the double slit experiment time can be seen as a barrier, a difficulty which particle and wave are unable to overcome. From this derives a new definition for time where:

Time is a difficulty. It is dependent from matter and space as the sum of all electromagnetic mediums and distances through which an object travels. Matter consists of mass and wavelength. An electromagnetic medium is stable when the differences in time is zero for particles with different masses. Vacuum is a medium without electromagnetic properties with zero influence on time, where time is just dependent from mass and distance.



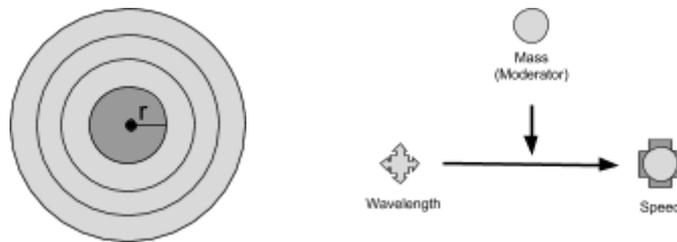
For example: Two objects with the same amount of mass are travelling in two different mediums (easy and heavy difficulty). They should both reach a certain aim at the same time. The object that travels in the heavy medium must travel faster so it can solve the task at the same time. This is what is also known as inertia. For some reason the interference pattern changes the difficulty for particles to travel in the very same medium and by this effect particles get naturally sorted according to their differences in the latent property.

Before particles get shot they need to be prepared for the double slit experiment so they are all in the same 'state' with the same velocity and wavelength. However this does not change the mass of particles but the pulse and as a consequence the wavelength and speed. The moment particles move through their own electromagnetic interference pattern the effect from preparation gets canceled and particles are moving again according to their masses with their natural speed along the interference with the new signal they send out now.

Stokes stated that the inertia of an object in motion is higher in a liquid (Stokes, 1844). Likewise the inertia of an electrically charged body was said to be higher than of an uncharged body (Thomson, 1881). Kaufmann produced a fundamental error by taking beta particles with different velocities and changing their speed so they moved with the same speed with the help of an electromagnetic interference (Kaufmann, 1901). Walter Kaufmann started to experiment with beta rays (or Becquerel rays). Beta rays are particles emitted from radium with different velocity. Naturally they are inhomogeneous in speed. Kaufmann changed the speed of particles with the help of an electromagnetic field. Kaufmann wrongly assumed that the particles are now homogenous since they had the same speed. But when measuring the mass it turned out that they differed in mass. The changes in position which formed a deflection curve which is indeed showing a difference in mass was believed to be caused by charge. Kaufmann stated that electromagnetism charges particles confirming Thomson's theory about electromagnetic mass. But particles had right from the start different masses. And changing the speed of them with the help of an electromagnetic field did not have any effect on mass. The mass was the same all the time and just speed was modified due to electromagnetic field.

Correlation between mass and speed of particles

The radius of a particle which is depend from mass. The larger the mass the larger the radius. The pulse is depend from the radius of the mass. The larger the mass the larger the wavelength. The larger the wavelength the slower the speed. As a consequence: The larger the mass the slower the speed. The double slit experiment revealed that there is high evidence that particles show considerable differences in speed. Differences in speed are pointing towards differences in mass. A higher velocity does not increase the mass, but a larger mass slows down the particle. The assumption of Kaufmann that mass changes is wrong. The particles always had differences in mass and with the electromagnetic field he just changed the pulse.



What really happens when it comes to the double slit experiment is that the electromagnetic field one uses to manipulate the speed of particles only influences the pulse of the wave. When getting in contact again with the interference - which is nothing but the particles own electromagnetic wave - the pulse changes back to its natural form where it corresponds with the mass. Now the particle has back its natural pulse. This also explains why an observer 'collapses' the wave. The wave does not collapse, but the particle changes its pulse through interference with the instrument. In a situation with an observer the particle is exposed to an electromagnetic field three times: Manipulation, own electromagnetic field and electromagnetic field of the observer.

Conclusion

There is a fundamental error in all physical theories following the results of Kaufmann and Thomson. Furthermore Young's theory and Bose-Einstein condensate are based on wrong assumptions. The De-Broglie-Bohm theory and quantum theory are not powerful enough to explain quantum phenomenons since they are based on a misinterpretation of the interference pattern. Wave-particle duality does not exist. As a consequence we assume that the theory of relativity might not be correct either. The Signal Wave Theory does not only offer an alternative, mechanical view, but a statistical one and is able to explain the phenomenon of wave-particle duality far much better. Further research is highly necessary.

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