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REBOUNDS OR SHOKS-IMPULSIONS OF MOVING CORPUSCLES AND PHOTONS GENERATING ASSOCIATED TRAJECTORY GUIDE WAVES: IN CLASSIC, QUANTIC PHYSICS AND IN EVTD^{2}THEORY

Michel CONTE, Ileana ROŞCA

Abstract:

The "walkers" (liquid drops) that rebound on the surface of the liquid subjected to intense vibration, as described by the very interesting experiments [1] are suggesting many reflections in classic, quantic physics and in EVTD^2 theory. These experiments are in good agreement with the EVTD^2 physics. In this study were able, again to wave-corpuscle duality, to guide waves but also to offer a different interpretation of the Young's fringes that could be arrival or forbidden bands of corpuscles and even of photons. These "roads" would be generated by interference of the associated waves to particles or photons movements. Their resulting fields would act as guiding waves that remotely the preferential routes up to the receiving screen.

Key words: *Rebounds of liquid drops, Young interference, guiding waves, quantic ether, substratum, wave-corpuscle duality, EVTD^2 theory.*

1. INTRODUCTION

Inside the hypothesis's where the quantic physics' wave-corpuscle duality would be correlated with the experiments described by Emmanuel Fort and Yves Couder in [1], this would suggest to follow comparison or parallel with EVTD^2 theory. [2-7] This last and recent theory postulate the existence of an universal electromagnetic field that would be primary and high frequencies vibrating and, whose wave length could be equivalent to Planck's length. Indeed the [1] experiments concern the displacements or "steps" of a liquid drop on the surface (substrate) of the liquid submitted to a vertical vibration. These cause, indeed, on this substrate an acceleration due to oscillations. The acceleration must be, in the least, superior to Earth gravity and maximum, slightly inferior to acceleration of triggering Faraday instability. Thus, not only the drop manifests a non-coalescence with the substrate, but it rebounds on the surface of such a substrate either in the same place, or still can move by successive rebounds above this surface. It is necessary to clarify that rebounding drop has not a real contact with the substrate, because the surrounding air layer has not enough time to be evacuated and it is returned to the top without contact. It is, it seems, "guided" by the wave field resulting from the accumulation of waves generated by its previous rebounds on the substrate. According to circumstances, the waves are accumulated and last more or less in the substrate. More the experimental tests relative to this type of rebound "steps", they are similarly reproducing light interference due to Young slits. Indeed, many "walkers" (liquid drops) lead, by varying accumulations of arrivals, to the same interference figures on a screen disposed behind slits adapted to this process. So, *a corpuscle seems to be associated*

to a wave system that himself has produced at the frequency of its own rebounds and, which further influences, according the environment, the directions (guidance) of his subsequent displacements. In fact, this seems to illustrate, *in microscopic dimensions,* what should happen in the quantic atomic and subatomic universe, where the waves and corpuscles are deemed complementary.

Moreover, these experiences highlight an effect of variable retention of number of waves generated by recent rebounds in the path taken by the drop. This generates a wave field complexity that could be increased according to the operating conditions. These last phenomena could be called "memory of the path".

2. QUANTIC PHYSICS CORRELATIONS OF WAVES WITH REBOUNDS

On another side, in [1] was also *highlighted a quantification of the circular journeys drop*. Indeed, you can see it when a Coriolis force undergoes (formal analogy with the Lorentz force), force who is here caused by the rotation of the plateau containing the substrate and transmitted to drop by its successive rebounds. Described orbits depend on the rotation speed and on "memory of the path". It seems to find, in certain conditions, an analogy with the quantic physics relative to effective electrons' orbits and, also, the vide space of forbidden bands zone. As a result of the conclusions found by the promoters themselves from their experiences [1], correlations in quantic physics could be obviously suggested relatively to the waves took into account in Schrödinger equation and, also, for Louis de Broglie in the case of pilot waves on one side and, on the other side, in the case of double solution. In these three concepts of quantic environment, the general hypothesis that waves could be associated and, more, could occur in the corpuscle being in phase with the external waves, was assumed. All this to statistically estimates corpuscles' properties (Schrödinger) or, more specifically try to determine the trajectories of these corpuscle waves (de Broglie). The origin of these associated waves was never described from the point of view of guiding physical phenomena for their emergence. E. Fort and Y. Couder mention in [1] that in their experiments, for macro dimensions, it is undeniable that the water of the liquid (substrate) is, somewhat, the presence of an "ether" on which rebounds occur and in which spreads the drop associated. The concept of ether, as a component of space-time, is out of date in relativistic and quantum physics for a long time but, since the consideration of the enigmatic dark matter and dark energy (representing 95% of the mass of the universe), the question of its existence or not is not definitively decided. More, the energy of the vacuum is agreed by conventional physics but the phenomena that would give its emergence are not invoked. This despites the fact, that logically the nothingness cannot be the best environment (support) to propagate such features.

The problem of the Schrödinger waves equation is that they are not directly deterministic but essentially probabilistic. Intrinsically they can be assimilated to be, of a certain manner virtual. However the good results of quantum physics allow surfing on these issues of guiding phenomena. With regard to the options of de Broglie they have not effectively led and it remains the overall notion of waves complementary to corpuscles. However experiments [1] must, in this case, provide a rationale for the continuation of studies of these latest conceptions.

After this brief analysis it is expected that correlations between [1] experiments and quantum physics, can be carried out only for certain general concepts. But this will be impossible because some details will be taken into account.

3. CORRELATIONS OF ROBOUNDS ASSOCIATED WAVES WITH THE SHOCS-IMPULSIONS OF EVTD^2 ENTITES THEORIE

The premise of the EVTD^2 entities theory is the existence, in the material and the empty space of matter, of a primary electromagnetic field. The structure everything is in cubic deformable and dynamic entities known as EVTD^2 which defines the key features [2-7]. So: *matter and empty space are, in very small*

dimensions, subject to the same vibration state of very high frequency. This represents a certain analogy with the basic postulate of the string theory. In addition, all of space-time (internal of the condensed matter and of matter vacuum) would be composed by what has been called "substratum" in preference to the enigmatic and obsolete ether (expected only outside material). This substratum would, under vibration, bring out the energy of the vacuum and those of material ($E = mc^2$). According to [8], this equivalence is simply verified. The substratum would be a yet unknown substance (maybe between black matter and energy) but which, somehow, must be at the origin of condensed matter, under certain conditions with the Higgs bosons. In fact, that what is defined as the mass of a material body is composed, as in the universe, by 5% of condensed matter, the rest being made up by what we call energy (black matter and energy). The paper [9] also shows this effectively but for the proportional constitution of protons and neutrons – subatomic elements. It seems that there is a certain similarity of the constitutions to the scales of the universe as much as the subatomic dimensions. The question that may be asked is for quarks: is it the same for them? Thus, close and close to the dimensions, extremely small, it may be asked what proportion, to the limit of real condensed matter that might, in the end, be the strings?

There is, here, the *analogy of space-time of the theory of EVTD^2 entities with the liquid substrate, animated in vibration from the experiences described in* [1]. It is to say also, an environment similar to those of the drop or corpuscle. It is important to add the considerations of electrons' shocks-impulsions on EVTD^2 (of orbital trajectory), creating the electromagnetic waves, as well as their space propagation [10], following the same principle. Therefore, the lights would arise initially from shock-impulses of electrons on the EVTD^2 according their orbit speed. Further, the sum of these shock-impulses (half "pushed" and half "pulled") would create the electromagnetic wave. It would be an expansion in amplitude and wavelength (following the differential: speed of the electron to *c*) during propagating out of the atom. [10] In the experiment [1] the liquid dropped from a certain height above the substrate, falls under the action of gravity. But when she arrives near the surface of the liquid, subjected to intense vibration (greater than *g*), this drop is also subject to the same vibration intensity oriented towards the top before touching the surface. Its fall speed is originally slowed, and then stopped a short instant, prior to contact, to be immediately returned to the top. Indeed this vibratory energy is much greater at this location, than gravity. At a certain height, the vibration effect of substrate decreases, allowing gravity to be more important and, the cycle can start again. In the EVTD^2 entities theory, the entire space-time plays the role, 3D, of the experiments substrate [1] which, by its surface, is two-dimensional. Therefore, it can be understood that a material particle in motion, in such space-time, directly causes contacts or shock-impulses on the constitutive entities EVTD^2. But, also, the particle *associated waves with the movement* will integrate the substrate. It is to mention that an immobile particle do not produce *this type of associated waves, which are caused only by the movement and, therefore, by the different percussions in matter. So, these waves must be related* ***primarily to the movement*** *rather than to an intrinsic feature of condensed matter* itself. It is therefore demonstrated that ***the essential thing to take into account is the exact nature of the vacuum allowing, during shocks-impulsions of the movement, the apparition and spreading of this type of waves***. In EVTD^2 entities theory, the substratum is the whole universe vacuum till the less atomic dimensions. Thus, generated waves will spread, close to close, in such substratum. Additional waves associated with the mobile will amalgamate and superpose in the substrate with the primary electromagnetic wave (EMW) structuring and animating this substratum. Thus it is to think, similar to experiences [1], that these associated waves could, in a certain manner, guide the particle by influencing the successive directions of its trajectory. This must be done in direct connection with its environment. Indeed, these associated waves that can be reflected on the environment physical barriers, make very complex their

global field, especially if the memory of the path is great.
It is obvious that the case of electromagnetic waves must be distinguished of those of material corpuscles because of their movement speed differentials. The waves associated to light are carried by the wave light itself or, better, they precede a few wavelength by effect of compaction of substratum in front of the shock-impulsion zone because their spreading is at the same speed *c*. Thus, the reflection effects on the environment, relatively distant, may not be influent, except in the case of an identical continuous wave stream and on condition of a good memory of the path.

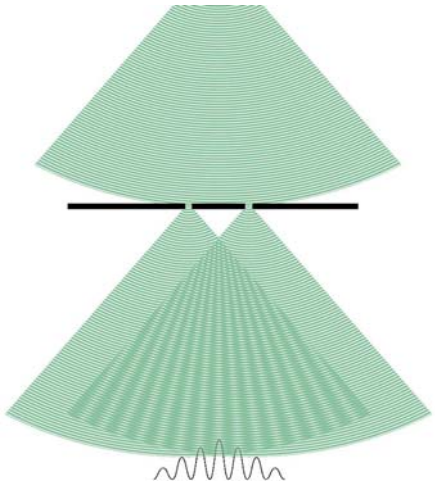

Fig. 1. Interference of movement associated waves of a mobile duplicated by Young slits in two sources (copied from Creative Commons).

While for other bodies material it is not similarly and the influence of the environment could play its role in the state of the resulting complex field: that allows the orientation of trajectories as in [1], but also in theory EVTD^2. In fact, the speed of material corpuscle associated waves is greater, most often, that those of the mobile: it would be possible to occur, on the trajectory, superposition of previous reflected associated waves and to influence of corpuscle movement. Contrarily, concerning previously mentioned singularity of *electromagnetic waves, it is to expect primarily direct induced effects by the features of met or touched environment*. It is then, to come back to curved trajectories in the space-time of general relativity and the phenomena of diffraction on the edge of the slits.

But if, in addition, it is accepted that short associated wave trains go before the electromagnetic shocks-impulses, [6, 10, 11] it is acceptable to conceive that the associated waves system twined by Young slits could further create an interference canvas similar to this presented in figure 1. If it is possible to figure in very little dimensions an almost identical behavior between the shock-impulses on EVTD^2 on one hand and, on the other hand, on a corpuscle, *it must be noted that* ***priority interferences are those of twins associated waves***. Considering [1] and consequently, for the EVTD^2 entities theory, the resulting field of the last ones must guide the trajectories of rebounds and of electromagnetic effects shock-impulses (EE rather than photon). In EVTD^2 theory a photon propagating in a direction is not a unitary and non-divisible grain of energy, but it results from the energetic assembling of a multitude of shock-impulses vectors, which for the considered direction, have variable intensities proportional with the amplitudes of an electromagnetic wave. The designation by electromagnetic wave assembling, or EE, seems more accurate and preferable to the appellation of photon! Therefore, the following assertions with respect to rebounds or shock-impulses and their guides can be:
- (a) in agreement with [1] the phenomena are obvious for the macroscopic mobiles and we can deduct that *they would be also likely for atoms and subatomic elements;*
- (b) accordingly the EVTD^2 theory and in correlation with [1] it is possible to affirm that *the bands, alternately black and light in the experiment with Young slits* ***do not result from a series of electromagnetic waves interferences*** *sent through the slits but, they are preferentially created* ***by established guidance to the areas of light bands of the screen and systematically abandoning the black bands areas.*** These would create prohibited areas or bands for “walkers”.
- in conclusion for (a) and (b), it would be possible ***the same understanding to explain the experiments of Young slits relative to a corpuscle and even to a unique EE (photon) sent one by one or, also, for an extrapolated EE flow.***

In fact, it is well known that directing a photon or an electron one by one through Young slits give, in long run, the same light and black bands without impact and with arrival of electrons. These figures are identical to those currently obtained for an intense flow of photons. From the figure 1, it is possible to observe that *the interference canvas of twins associated waves* resulted from two Young slits (serving for sources) creates in space representatives radial areas alternately, of two types of interference. Thus, there are areas (in the space between the slits and the screen) that present on one side, strong amplitudes (in phase) and, on the other side, minimum energy (opposite phase) of resulting associated waves. In correlation with the experiments [1], it can be assumed with some logic that *these areas structured by vibration energy gradients could reflect and further guide the trajectory of a corpuscle and, also, of a multiple EE shock-impulse* forming, in EVTD^2 theory, the structure in very little dimensions of a photon wavelength. Thus, the phenomena involved in corpuscles movement and in EE shock-impulses spreading would be of analogous causality. In the end it succeeds in this unexpected finding, in conventional physics, ***that even for electromagnetic waves***, the fringes systems given by the Young slits ***could result from the alternative canvas of effectively guided trajectories or from prohibited or unfinished trajectories.***

4. CONCLUSION

The consequences resulting from this study are very important:

- the Schrödinger waves would find their causality in the canvas resulting from interference of the waves associated to mobiles that generate them in the substrate – substratum by rebounds or by percussions;
- the pilot waves would be defined as results of complex interference fields given by waves associated to percussions or reflections on the environmental matter;
- the dual and the complementary wave-corpuscle is somehow accepted due to the obedience of the corpuscle and of EE to follow "pre-oriented" trajectories;
- this effective duality would exist only for EE because it presents the structure of a multiple electromagnetic shock-impulses assembling in a wave form. For material corpuscles would be better to speak about waves associated to movements.

In this very journal a logic continuation of this paper is presented: three other publications. They propose either explanation for the enigmatic results of Mach-Zehnder and Franson interferometers, as well as for Rauch experiments with the neutron.

5. REFERENCES

1. Fort E., Couder Y. I. La dualité onde corpuscule à l'œil nu, Revue « Pour la Science » Numéro Spécial n 409, Novembre 2011
2. Conte M., Rosca I. Short presentation of EVTD^2 entities theory, International Workshop Advanced Researches in Computational Mechanics and Virtual Engineering 18-20 October, Brasov, Roumanie, 2006
3. Conte M., Rosca I. Introduction in a new mechanical theory of the universal space –time based on EVTD^2 entities, Acta Technica Napocensis, Series: Applied Mathematics and Mechanics, 50, Vol. II, 2007
4. Conte M., Rosca I. Conception d'un espace-temps universel, quantique et relativiste : pour une physique de réconciliation, Acta Technica Napocensis, Series: Applied Mathematics and Mechanics, 53, Vol. III, 2010
5. Conte M., Rosca I. Une histoire de famille : Photon, Graviton, X-on et compagnie, Ed. Triumf, Brasov, Roumanie, 2002
6. Conte M., Rosca I. Physique de TOUT. Les EVTD^2, Ed. Graphica, Brasov, Roumanie, 2004
7. Conte M. Histoire amoureuse du Temps, Ed. Graphica, Brasov, Roumanie, 2006
8. Conte M., Rosca I. Approach of the postulate $E=MC^2$ by the theory of EVTD^2 from the mechanic and phenomenon point of view, 9th International Researches / Expert Conference "Trends in Development of Machinery and Associated Technology", TMT 2005 Antalya, Turkey, 26-30 September, 2005,
9. S. Durr, Z. Fodor, L. Lellouch and al., Ab-initio determination of light hadron masses, Science 21 November 2008, Vol. 322, n°5905, pp 1224-1227

10. Conte M., Rosca I. Fondement d'une force de forme dans les mouvements des corps naturels : revisite des bandes d'énergie et des bandes interdites des électrons. Acta Technica Napocensis, Series: Applied Mathematics and Mechanics, ISSN 1221-5872, Vol. 52, Issue I, 2009,

11. Roşca I., Conte M., An explanation for the indivisibility of the Planck's quantum by EVTD^2 entities theory, 11th International Researches / Expert Conference "Trends in Development of Machinery and Associated Technology", TMT 2007 Hammamet, Tunisia, 5-9 September, 2007,

Reculuri sau impulsuri ale corpusculilor în mişcare şi ale fotonilor, generând unde asociate ghidate: în fizica clasică, cuantică şi în teoria EVTD^2

”Călătorii„ (picături de lichid) care reculează pe suprafața lichidului din care provin, supus la acțiuni vibratorii intense, așa cum este explicat în foarte interesantele experimente [1], sugerează multe reflexii în fizica clasică, cuantică, precum și în teoria entităților EVTD^2. Aceste experimente sunt în foarte bun acord cu fizica teoriei EVTD^2. In acest studiu ajungem, din nou, la dualitatea undă-corpuscul, la unde pilot dar și să propunem o altă interpretare a franjelor Young ce ar putea bande de sosire sau interzise a traiectoriilor corpusculilor și chiar ale fotonilor. Aceste ”rute„ ar putea fi generate de către interferenta undelor asociate mişcărilor corpusculilor sau fotonilor. Câmpurile rezultante s-ar comporta ca unde pilot conducând pe traiectorii preferențiale până la ecranul receptor,

Michel Conte, Ph.D., Honorary Professor of Transilvania University of Brasov, michelconte13104@gmail.com.

Ileana Roşca, Ph.D., Professor, Transilvania University, Fine Mechanics and Mechatronics Department, ilcrosca@unitbv.ro, Phone: 0040 744317171, 18/A/10, Bd. Gării, Braşov, Romania,