

ABOUT THE NATURE OF THE ELECTRON AN ANALYSIS OF THE TWO-SLIT EXPERIMENT

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ABSTRACT: *The analysis of some experiments reveals the dual behavior of electrons as a result of their interaction with photons.*

KEYWORDS: *Nikola Tesla, the double split experiment.*

1. INTRODUCTION

Michael Faraday invented the first DC electric motor, intuitively. Subsequently, scientists of that time tried to explain operation, and to specify the sizes used, the electric current was considered to be formed by positive charges, then called electrons.

Later it was discovered that the electron has the negative electrical charge. Millikan first determined the value of the specific charge of the electron - the value of the ratio (e/m). So: now, in classical physics, is used as a particle electron notion of "power" which is characterized by the basic load value of $e = 1.6 \cdot 10^{-19}$ C, and mass $m = 9.1 \cdot 10^{-31}$ kg.

Classical

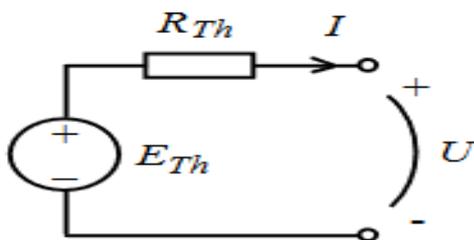


Figure 1

Source:

http://www.unibuc.ro/prof/dinca_m/miha-p-dinc-elec-manu-stud/docs/2011/sep/19_11_14_00cap_2_v3.pdf

Since the beginning of the electric domain, duality has been manifested:

- physical sense of electric current when talking about electrons: through the outer circuit they go to the positive terminal of the source;
- technical sense of electric current, when talking about the intensity of electric current, I ; its sense i is toward the negative terminal of the source via the external circuit as if the current consisted of positive electric charges.

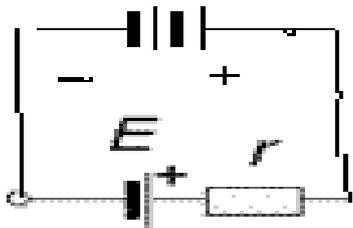
2. OBSERVATION

Electrons are generated by chemical sources - electric batteries - only in one direction: to the positive terminal through the outer circuit and no data in the opposite direction.

Nikola Tesla

He is the owner of patents for all types of electric machines: motor, generator and transformer in mono and polyphase systems of alternating current. In fact, all alternative current applications are based on Nikola Tesla's inventions . This "genius of electrotechnics" made a surprising statement, easy to check in practice: "It is much better for DC power to be drawn between two terminals with

the same sign but at different potentials" (quoted about memory).



This statement calls into question the corpuscular character of elementary electrical charges, e^- .

This would mean that the electrons reverse in the lower-potential chemical source without physically destroying them.

If the electron is considered to be a particle, it is impossible; but it could be possible if the electron is viewed as a packet of waves.

3. THE DOUBLE SLIT EXPERIMENT

It is a complex experiment, the consequences of which are still not fully evaluated, despite its age.

Simplified description:

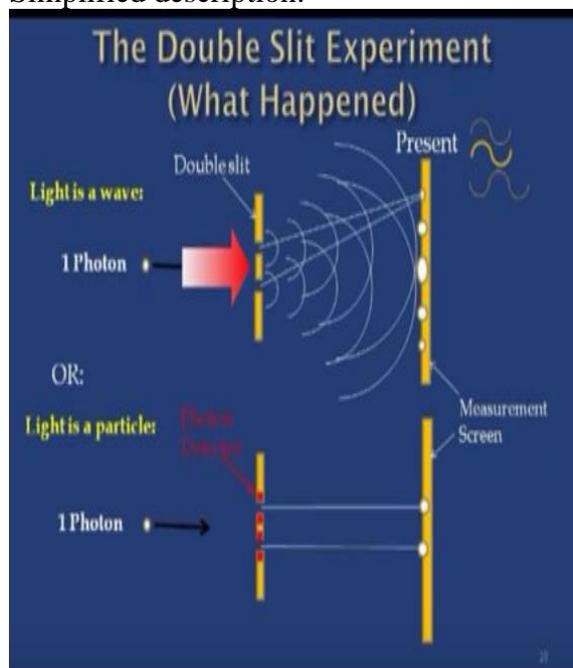


Fig. 2

Source:

<https://www.youtube.com/watch?v=LW6Mq352f0E>

In principle, a photon beam is projected onto a two-aperture screen, behind which is another screen. When passing through the two slots simultaneously, the photons will have wavy behavior; an interfering figure consisting of minimum and maximum successive behaviors similar to waveforms (waveform behavior) will appear on the screen.

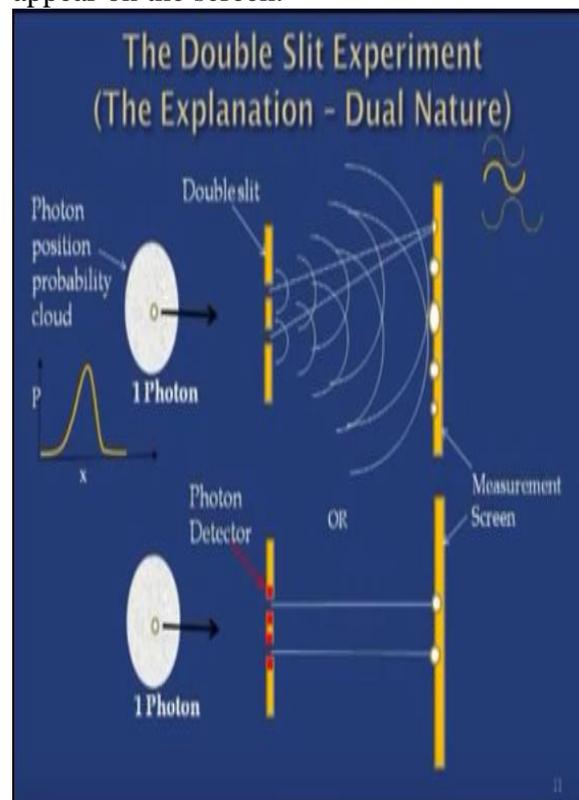


Fig. 3

Source:

<https://www.youtube.com/watch?v=LW6Mq352f0E>

In the next step, photons are replaced with electrons. In their turn, the electrons will have wavy behavior when passing through the two slits. An interference figure composed of the minimum and maximum successes will appear identically on the screen.

This experiment was repeated with the whole range of particles, from photons to atoms.

The experiment was also carried out with specially designed generators that emit the particles one at a time, in a previously established cadence.

Each time the same wavelet behavior was revealed when passing the "particles" through the two slits.

Further, a supplementary condition was imposed: installing a particle position detection detector for the purpose of: through which slit passes each particle so that, finally, the interference image to be reconstituted. Here is the paradox! In the presence of the detector - which indicates by which of the two slits each particle passes - all particles isi mentin corpuscular characteristic after the passing by the two slits. The interference picture is no longer recreated. Now, there are two clusters of particles centered on each slit on the screen.

To be able to decipher, at least partially, this behavior, we must recall the principles of conducting an experiment.

a)To conduct an experiment it is necessary to conjugate three factors:

1. The observer: decides nature, location and way of the experiment; In addition, the observer introduces "random errors" during the experiment due to "human nature."
2. Measuring instruments used, regardless of complexity, which in turn introduce so-called "systematic errors".
3. Subject or phenomenon under experiment.

- a) For the result of an experiment to be recorded, photographed, it is necessary for the subject to be tested to be illuminated; the wavelength of the radiation used to be comparable in size as the object dimensions

4.SPECIFICATION OF IDEAS FOR TWO-SLIT EXPERIMENT

- wavelength of the particles in the absence of the detector;

- corpuscular behavior of the particles in the presence of the detector.

But the detector, in turn, involves the presence of the photons that carry the

transfer information between the particles and the detector.

At the quantum level, each particle associates a so-called "packet of waves" so we can assume:

- in the absence of interaction with the photons from the outside the package is manifested from where, thus, the wave-like behavior marked by the appearance of the interference figure;

- In the presence of external photons, so in the presence of the detector, the wave function associated with the particle collapses and remains the corpuscular manifestation when passing through the two slits.

CONCLUSIONS AND POSSIBLE APPLICATIONS

1.In conductors and in energy sources, electrons do not interact with outside photons. So there is the specific behavior of the packets of waves, which would allow their passage in the opposite direction to the potential difference, according to Nikola Tesla.

2. All the electrons from the surface of the conductor behave corpuscularly, due to the interaction with the photons from the outside; what could be an explanation for the "photoelectric effect".

3.Electrons inside the conductor behave like waves (lack of interaction with the photons from the outside), which would be an argument for moving the electrical potential through a conductor with speeds close to the speed of light.

4..With direct application, it is possible to capture an image on a glossy metal surface and electromagnetically process it, a phenomenon similar to what happens on the retina.

As a final conclusion, the words reproduced by THOMAS CAMPBELL are noteworthy:

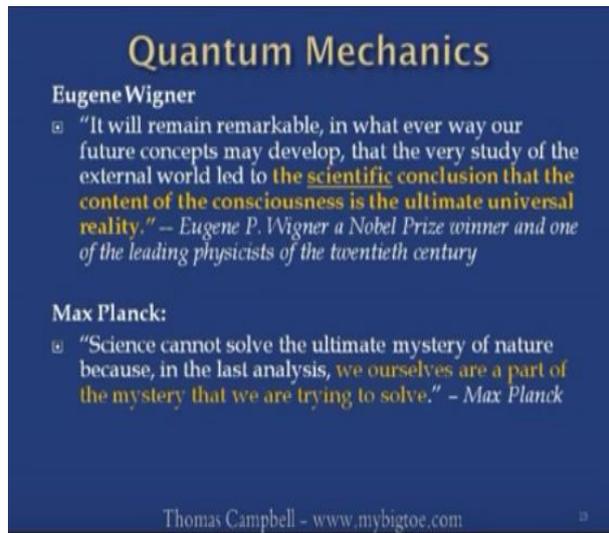


Figure 4

Source:

<https://www.youtube.com/watch?v=LW6Mq352f0E>

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