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Some Thoughts on the Collapse of the Wavefunction

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Abstract:*This article reflects the author's experience after working decades in the field of research in the hidden variables of quantum mechanics. We do not reach a definite conclusion but we believe this paper could be useful for the course of this research in the foundations of quantum mechanics. The basic argument is that the collapse of the wave function during measurement could be associated with a relations between the surfaces of constant psi and a point particle having a flux.*

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I. Introduction

The reader should refer to a series of articles published mostly in the present journalThe most profound problem in the foundations of the physics of the micro world Is ascribing an elementary volume to a point particle. Our belief as has been written down is that the situation resembles that of tiny droplets surround by a matrix of turbulent layer inside a vorticity field. After all the particle is said to have a spin. Associated with this is our finding that in expanding the rotation of the vorticity an equation of two dimensional turbulence is given taking place on those surfaces of constant value for the wave function. There is a possibility that this surface collapses to a point particle with a flux something like a magnetic monopole.

II. Main part

A first query about the radius of these swirling droplets or elementary particles should be sought in the relativistic radius of the electron. This will only give us information about the dimension of this curvature as related to the fine structure constant.

$$\alpha = \frac{e^2}{4\pi\varepsilon_0 \hbar c} \qquad (1)$$

$$mc^2 = \frac{e^2}{4\pi\varepsilon_0 R} = K\frac{e^2}{4\pi\varepsilon_0} \Rightarrow \alpha[K] = \left(\frac{\hbar}{mc}\right)^{-1} = \frac{1}{\lambda_c} \qquad (2)$$

However it is forbidding that we should assign a point volume through the use of differential equations. We should rather examine the properties of the surfaces of constant psi.

First of all associated with the problem of find an elementary radius to a point is the problem of the polarization. A dipole moment is defined as the limit of a big charge times a small radius going to zero. We will find the polarization charge of the equal probability surfaces:

$$\oiint \vec{P} d\vec{S} = q_p \qquad (3)$$

On the surfaces of constant probability this turns out to be:

$$\oiint \overline{P} d\vec{S} = \frac{e}{N}\oiint |\psi|^2 \vec{r} d\vec{S} = ePV = q_p \qquad (3)$$

So the collapse of such a surface to a point is a good candidate for giving a value to a point volume.
Another fact we know about these surfaces is that there is no flux of vorticity through them and the turbulence is their own characteristic:

$$\iint \vec{\Omega} d\vec{S} = \iint \nabla \times \left(|\psi|^2 \vec{\chi}\right) d\vec{S} = \hbar \oint |\psi|^2 d\phi + \hbar \oint |\psi|^2 \vec{A} d\vec{l} \qquad (4)$$

On any generally open surface the first term gives the area the wave function describes in the complex plane. In our case of equiprobable surfaces this gives:

$$\oiint \vec{\Omega} d\vec{S} = \frac{\hbar}{e}|\psi|^2 \delta\phi + |\psi|^2 \Phi_B = |\psi|^2 \Phi_B \qquad (5)$$

We have already proved that there is an elementary flux associated with a point volume through the integration of:

$$\iint |\psi|^2 \frac{d\phi}{dt} dV = \oiint I d\phi \quad (6)$$

Next we are going to calculate the flux through a closed psi surface of the force density:

$$\oiint \vec{\alpha} d\vec{S} = P \oiint \nabla U d\vec{S} = \frac{|\psi|^2}{N} Ze^2 \quad (7)$$

Another final point to be made is that on surfaces of equal probability the kinetic energy contained differs most from the potential:

$$\oiint \nabla P d\vec{S} = \oiint \Delta P dV = \max \quad (8)$$

One might wonder about the helicity of this flow. It is found to be:

$$\int \vec{\chi} \cdot \overline{\Omega} dV = |\psi|^2 \int \vec{A} \cdot \vec{B} d\vec{S}$$

Therefore only the magnetic field produces helicity.

III. Conclusion

We have found out that the surfaces of constant value of the probability may give an answer to the riddle of how a point volume is described in terms of mathematics. The answer is through the flux assigned to a point or a surface. These surfaces should collapse to a point particle whenever a classical measurement is achieved. We have not found out the way it happens but we hope that the researchers will find our talk useful.

References

[1]. Is Schrodinger equation describing a turbulent flow? , Academic Research Publishing, Scientific Review, vol.1, no 5,pp 99-101, 2015, SpirosKoutandos, Jaime Vigo

[2]. Some reflections on the evaporation and condensation phenomena, IOSR, Journal of Applied physics ,vol 9, issue 5, ver III, pp47-48, Sep-Oct 2017 , SpirosKoutandos

[3]. A newly proposed model for the electron , IOSR, Journal of Applied Physics, vol 10, issue 4, ver II , p35-37, SpirosKoutandos

[4]. Regarding the total time derivative of the radius, IOSR, Journal of Applied Physics, vol 10, issue 6, ver I p 26-27, Nov-Dec 2018 , SpirosKoutandos

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