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Point in Double Surface

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Abstract: : *The point in the double surface was discussed*

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1. Introduction

According to Euclidean geometry the point is without dimensions. Let's see how it is with the double surface geometry.

2. Length in the Double Surface

In the double surface of the atom orbit the length has the elliptic, the average elliptic-hyperbolic and the hyperbolic value. Being denoted n, s(n) and h(n), respectively and expressed in Compton wavelengths of the electron the concerned values are related as follows [1]:

First

$$s(n) = n\left(2 - \frac{1}{\sqrt{1 + \frac{\pi^2}{n^2}}}\right). \tag{1a}$$

$$s(0) = 0. \tag{1b}$$

Here for the zero elliptic length $n = 0$ the zero average elliptic-hyperbolic length $s(0) = 0$ is given.

And second

$$h(n) = n\left(2\sqrt{1 + \frac{\pi^2}{n^2}} - 1\right). \tag{2a}$$

$$h(0) = 2\pi. \tag{2b}$$

But here for the zero elliptic length $n = 0$ the nonzero hyperbolic length $h(0) = 2\pi$ is given. (See appendix)

The smallest part of the electron in the double surface of the atom orbit is thus without the elliptic dimension as well as without the average elliptic-hyperbolic dimension, too. But its hyperbolic dimension is nonzero yielding the exact value of 2π Compton wavelength of the electron.

3. Time in the Double Surface

The length enables the path x provided on it which is related to the time and the speed of light c as follows:

$$t = xc^{-1}. \tag{3a}$$

a) To the zero elliptic length $n = 0$ belongs the zero elliptic time:

$$t_{elliptic} = 0. \tag{3b}$$

b) As well as to the zero average elliptic-hyperbolic length $s(0) = 0$ belongs the zero average elliptic-hyperbolic time:

$$t_{average} = 0. \tag{3c}$$

c) But to the shortest hyperbolic length $h(0) = 2\pi$ belongs the nonzero hyperbolic time:

$$t_{hyperbolic} = 2\pi\lambda_{electron}c^{-1}. \tag{3d}$$

Knowing Compton wavelength of the electron $\lambda_{electron} = 2.426\,310\,238\,67.10^{-12}m$, and the speed of light $c = 2.997\,924\,58.10^{8}\,ms^{-1}$ the shortest hyperbolic time of the electron in the atom is given:

$$t_{hyperbolic} = 5{,}085\;.10^{-20}s. \tag{3e}$$

In this time the smallest part of the electron is located in the shortest hyperbolic distance of 2π Compton wavelengths of the electron around its dimensionless elliptic and average elliptic-hyperbolic point.

4. INSTEAD OF CONCLUSION

We can propose:

The smallest part of any particle is located in the shortest hyperbolic distance of 2π Compton wavelengths of that particle around its dimensionless elliptic and average elliptic-hyperbolic point. In the shortest hyperbolic time determined by the Compton wavelength of the concerned particle $\lambda_{Compton}$ and the speed of light c:

$$x_{hyperbolic} = 2\pi\lambda_{Compton}. \tag{4a}$$

And

$$t_{hyperbolic} = 2\pi\lambda_{Compton}c^{-1}. \tag{4b}$$

REFERENCES

[1] Janez Špringer. " Coexistence in Bohr Orbit" International Journal of Advanced Research in Physical Science (IJARPS), Vol 11, issue 07, pp. 4-5., 2024.

APPENDIX

$$h(n) = n\left(2\sqrt{1+\frac{\pi^2}{n^2}} - 1\right). \tag{2a}$$

For enough small n the influence of positive unit under the square root can be neglected and the square root calculated:

$$h(n) \approx n\left(2\frac{\pi}{n} - 1\right).$$

For enough small n the influence of negative unit inside parentheses can be neglected, too. Giving

$h(n) \approx 2\pi.$

What for zero n results

$$h(0) = 2\pi. \tag{2b}$$

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