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Offered Inverse Fine Structure Constant

(Love at first sight)

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Abstract: : *The value of the inverse fine structure constant yielding* $\alpha^{-1} = 137{,}035\ 999\ 485$ *is offered.*

Keywords: *Inverse fine structure constant, double surface geometry*

1. Introduction

Let us take some look at the inverse fine structure constant in the light of double surface geometry.

2. The Inverse Fine Structure Constant

The CODATA suggested value of the inverse fine structure constant is the next [1]:

$$\alpha^{-1}_{CODATA} = 137.035\ 999\ 177. \tag{1a}$$

It counts the path of the electron on Bohr orbit in Compton wavelengths of the electron. The value is average elliptic-hyperbolic and is implicitly related to the elliptic value as follows [2]:

$$137.035\ 999\ 177 = {\alpha^{-1}}_{elliptic-hyperbolic} = {\alpha^{-1}}_{elliptic}\left(2 - \frac{1}{\sqrt{1 + \frac{\pi^2}{\alpha^{-2}_{elliptic}}}}\right). \tag{1b}$$

Taking into account the above equation the elliptic value of Bohr orbit path is then the next:

$${\alpha^{-1}}_{elliptic} = 136{,}999\ 992\ 920\ 8. \tag{1c}$$

Let us take some look at the units in the light of double-surface geometry, too.

3. The Average Elliptic-Hyperbolic Unit and the Elliptic Unit

Both units are related as follows:

$$1 = unit_{elliptic-hyperbolic} = unit_{elliptic}\left(2 - \frac{1}{\sqrt{1 + \frac{\pi^2}{unit^2_{elliptic}}}}\right). \tag{2a}$$

With the help of the above equation the elliptic unit is given:

$$unit_{elliptic} = 0.546\ 897\ 427\ 7\ \ldots \tag{2b}$$

4. The Ratio of the Elliptic Bohr Orbit Path and the Elliptic Unit

Interesting is the ratio R of two components: the elliptic Bohr orbit path, i.e. ${\alpha^{-1}}_{elliptic} = 136{,}999\ 992\ 920\ 8$ and the elliptic unit, i.e. $unit_{elliptic} = 0.546\ 897\ 427\ 7\ldots$:

$$R = \frac{{\alpha^{-1}}_{elliptic}}{unit_{elliptic}} = \frac{136{,}999\ 992\ 920\ 8}{0.546\ 897\ 427\ 7} = 250.503\ 999\ 437. \quad (3a)$$

It can be written approximately as follows:

$$R = \frac{{\alpha^{-1}}_{elliptic}}{unit_{elliptic}} = 250.504 = 250.5 + \frac{1}{250}. \quad (3b)$$

Approximate value - because of its beauty - can be bought as an exact one. And the inverse fine structure constant can be offered as a consequence of love at first sight.

5. The Offered Inverse Fine Structure Constant

The offered elliptic value of Bohr orbit path is then the next:

$${\alpha^{-1}}_{offered\ elliptic} = 250.504\ \ unit_{elliptic} = 250.504\ x\ 0.546\ 897\ 427\ 7\ \ldots \quad (4a)$$

Thus

$${\alpha^{-1}}_{offered\ elliptic} = 136.999\ 993\ 229\ \ldots \quad (4b)$$

Then the average elliptic-hyperbolic Bohr orbit path is calculated and offered as the inverse fine structure constant:

$${\alpha^{-1}}_{offered\ elliptic-hyperbolic} = 136.999\ 993\ 229\left(2 - \frac{1}{\sqrt{1 + \frac{\pi^2}{136.999\ 993\ 229^2}}}\right). \quad (5a)$$

Thus

$${\alpha^{-1}}_{offered\ elliptic-hyperbolic} = 137.035\ 999\ 485. \quad (5b)$$

6. The Comparison of the Offered and the Precisely Measured Inverse Fine Structure Constant

The offered inverse fine structure constant differs from the last known precisely measured value of the inverse fine structure constant on the seventh decimal as follows [3]:

$$137.035\ 999\ \mathbf{4}85 = {\alpha^{-1}}_{offered} \approx {\alpha^{-1}}_{measured} = 137.035\ 999\ \mathbf{2}06. \quad (6)$$

7. Data and Results

The data and results are collected in Table1.

Table1. *The collected data and results regarding the inverse fine structure constant*

	Elliptic value	Average elliptic-hyperbolic value
Inverse fine structure constant α^{-1}_{CODATA}	136.999 992 920 8	137.035 999 177
Unit	0.546 897 427 7 ...	1
Ratio $\frac{\alpha^{-1}_{CODATA}}{unit}$	250.503 999 437 ($\approx$ 250.504)	
Offered ratio $\frac{\alpha^{-1}_{offered}}{unit}$	$250.504 = 250.5 + \frac{1}{250}$	
Offered inverse fine structure constant $\alpha^{-1}_{offered}$	**136.999 993 229**	**137.035 999 485**
Inverse fine structure constant $\alpha^{-1}_{measured}$[3]		137.035 999 206

8. Conclusion

True beauty reveals but false beauty conceals the truth

DEDICATION

To my granddaughter Noemi for her third birthday. Radenci, July 26, 2024

Figure1. *The breathtaking beauty of nature [4]*

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