Comparative analysis of the recommended CODATA (2010) values of the fine structure constant, Planck's constant, electron mass and Newton's gravitational constant with the calculated theoretical values of the Pi-Theory of the fundamental physical constants.

The National Institute of Standards and Technology published values of fundamental physical constants (2010), recommended by the Committee on Data for Science and Technology the world scientific community.
Anticipating further exposition, we note that all presented in this article the formula is derived in the Pi-theory of the fundamental physical constants (hereinafter - the Theory), and not taken, they say, "the ceiling".
Theory, for finding the parameters of the physical reality, there is only one free parameter - the number pi. In the theory of absolutely no randomly introduced the dimensionless and dimensional parameters.
In Theory, any physical quantity has the dimension $sm^{\pm n} \cdot s^{\mp m}$, ie system of units $L \cdot T \left[sm^{\pm n} \cdot s^{\mp m} \right]$ (n and m – natural numbers and zero), that the well-known system of units SGS distinguished by the fact that, in the $L \cdot T$ normalized - mass conversion efficiency of energy k_m, has dimension $\left[sm^2 \cdot g^{-1} \right]$, mass unit 1g unit area $1sm^2$:

$$k_m = \frac{1sm^2}{1g} = 1 \left[sm^2 \cdot g^{-1} \right] \tag{1}$$

In Theory, theoretically calculated the fine structure constant and the anomaly of the magnetic moment of the electron $a_{\pi e}$, and unknown to the scientific community, the dimensionless constants: a constant scale $\psi_{\pi C}$, the volume of an elementary scalar $v_{\pi s}$ and $\beta_{\pi\alpha}$ – *factor* of the fine structure constant factor (factor of the fine structure constant), the incoming rate in $\psi_{\pi C}$ and $v_{\pi s}$ out.
The above list of options found in the Theory is far from complete. Lists only those constants that are directly related to the subject of this article.
In Theory, the lower the symbol "π" in the designation of a physical parameter indicates that this parameter is the theoretical result of a decision of the equations of the theory.

Input data for theoretical calculations of the values of dimensionless fundamental constants:

$$\pi = 3.141\ 592\ 653\ 589\ 793\ 238\ 462\ 643\ 383\ 2795 \tag{2}$$

Results of accurate theoretical calculations of the values of dimensionless fundamental constants:

$$\alpha_\pi = 7.297\ 352\ 572\ 519\ 857\ 423\ 545\ 858\ 624\ 3837 \cdot 10^{-3} \tag{3}$$

$$a_{\pi e} = 1.159\ 652\ 180\ 787\ 571\ 998\ 623\ 049\ 923\ 4930 \cdot 10^{-3} \tag{4}$$

$$\psi_{\pi C} = 1.669\ 642\ 831\ 928\ 813\ 892\ 580\ 472\ 149\ 4893 \cdot 10^{-23} \tag{5}$$

$$v_{\pi s} = 1.547\ 377\ 464\ 048\ 982\ 932\ 833\ 294\ 757\ 2253 \cdot 10^{-8} \tag{6}$$

Calculations α_π, $a_{\pi e}$, $\psi_{\pi C}$ and $v_{\pi s}$ performed with 32 bit precision, ensuring that, on the one hand, the impossibility of "manipulation" of data, on the other - provides the ability to test the theory of equations.

We write the expression:

$$R_{\pi\infty} = k_R \cdot R_\infty \left[см^{-1} \right] \tag{7}$$

where:
R_∞ – Rydberg constant;
k_R – numerical coefficient.
We write the expression:

$$c_\pi = k_c \cdot c \tag{8}$$

where:

c_π – rate of change in the parameters of the physical reality;

k_c – numerical coefficient;

c – the speed of light in vacuum.

For numerical calculations of the fundamental constants using the following formula Theory:
Compton wavelength of an electron:

$$\lambda_{\pi C} = \frac{\alpha_\pi^2}{2} \cdot \frac{1}{R_{\pi\infty}} \left[sm \right] \tag{9}$$

Elementary metric volume:

$$v_{\pi m} = \left(\frac{h_\pi}{c_\pi} \right) = \left(\frac{h \cdot k_m^2}{c \cdot k_c} \right) = \sqrt{\pi} \cdot \psi_{\pi C} \cdot \frac{1}{R_{\pi\infty}^3} \left[sm^3 \right] \tag{10}$$

Electron mass:

$$m_{\pi e} = \frac{2}{\alpha_\pi^2} \cdot \left(\frac{h_\pi}{c_\pi} \right) \cdot R_{\pi\infty} \left[sm^2 \right] \tag{11}$$

Elementary scalar volume):

$$v_{\pi s} = \frac{m_{\pi e}}{\lambda_{\pi C}^2} = \frac{8}{\alpha_\pi^6} \cdot \sqrt{\pi} \cdot \psi_{\pi C} \tag{12}$$

Planck's constant:

$$h_\pi = \left(\frac{h_\pi}{c_\pi} \right) \cdot c_\pi \left[sm^4 \cdot s^{-1} \right] \tag{13}$$

Quantum of circulation:

$$q_{\pi c} = \left(\frac{h_\pi}{m_{\pi e}} \right) = \frac{\alpha_\pi^2}{2} \cdot \frac{c_\pi}{R_{\pi\infty}} \left[sm^2 \cdot s^{-1} \right] \tag{14}$$

The product of the quantum of circulation by the square of the electron mass:

$$q_{\pi c} \cdot m_{\pi e}^2 = \frac{2}{\alpha_\pi^2} \cdot \left(\frac{h_\pi}{c_\pi} \right)^2 \cdot c_\pi \cdot R_{\pi\infty} \left[sm^6 \cdot s^{-1} \right] \tag{15}$$

Newton's gravitational constant:

$$G_\pi = \frac{\psi_{\pi C}^2}{4 \cdot \pi^2} \cdot \frac{q_{\pi c}^2}{v_{\pi m}} \left[sm \ \cdot s^{-2} \right] \tag{16}$$

Here are the results:

- "direct" experimental determination α (M. Cadoret and others): (20) и (22);
- "direct" experimental determination a_e (G. Gabrielse and others): (24) и (27);
- theoretical definition $\alpha(a_e)$ (G. Gabrielse and others): (26) и (29);
- data CODATA (2010): a_e and α, (30) and (31) respectively.

It should be borne in mind that the calculations used only the mean values of the constants.

Initial theoretical estimates Theory - dimensionless fundamental constants:

$$a_{\pi e} = 1.159\ 652\ 180\ 787\ 581 \cdot 10^{-3} \tag{17}$$

$$\alpha_\pi = 7.297\ 352\ 572\ 519\ 857 \cdot 10^{-3} \tag{18}$$

$$\alpha_\pi^{-1} = 137.035\ 999\ 023\ 2305 \tag{19}$$

Comparison of data

Source: M. Cadoret et al. Precise determination of h/mRb using Blochoscillations and atomic interferometry: a mean to deduce the fine structure constant. An article in the electronic archive of

preprints: arXiv:0809.3167v1 (18 Sep 2008).

$$\alpha^{-1} = 137.035\ 998\ 87\ (\mathbf{64}) \qquad \alpha_\pi^{-1} - \alpha^{-1} = +0.000\ 000\ \mathbf{15} \tag{20}$$

$$\alpha = 7.297\ 352\ 581 \cdot 10^{-3} \qquad \alpha_\pi - \alpha = -0.000\ 000\ 009 \cdot 10^{-3} \tag{21}$$

Source: M. Cadoret et al. Combination of Bloch Oscillations with a Ramsey-Borde' Interferometer: New Determination of the Fine Structure Constant. An article in the electronic archive of preprints: arXiv:0810.3152v1 (17 Oct 2008).

$$\alpha^{-1} = 137.035\ 999\ 45\ (\mathbf{62}) \qquad \alpha_\pi^{-1} - \alpha^{-1} = -\ 0.000\ 000\ \mathbf{43} \tag{22}$$

$$\alpha = 7.297\ 352\ 550 \cdot 10^{-3} \qquad \alpha_\pi - \alpha = +0.000\ 000\ 022 \cdot 10^{-3} \tag{23}$$

Source: G. Gabrielse, D. Hanneke, T. Kinoshita, M. Nio, B. Odom. New Determination of the Fine Structure Constant from the Electron *g* Value and QED. *Physical Review Letters*, 97, 030802 (2006).

$$a_e = 1.159\ 652\ 180\ 85\ (\mathbf{76})\ \cdot 10^{-3} \qquad a_{\pi e} - a_e = -0.000\ 000\ 000\ \mathbf{06} \cdot 10^{-3} \tag{24}$$

$$\alpha = 7.297\ 352\ 5359\ (\mathbf{51}) \cdot 10^{-3} \qquad \alpha_\pi - \alpha = +0.000\ 000\ 0\mathbf{366} \cdot 10^{-3} \tag{25}$$

$$\alpha^{-1} = 137.035\ 999\ 710\ (\mathbf{96}) \qquad \alpha_\pi^{-1} - \alpha^{-1} = -0.000\ 000\ \mathbf{687} \tag{26}$$

Source: D. Hanneke, S. Fogwell, G. Gabrielse. New Measurement of the Electron Magnetic Moment and the Fine Structure Constant. *Physical Review Letters* 100, 120801 (2008).

$$a_e = 1.159\ 652\ 180\ 73\ (\mathbf{28})\ \cdot 10^{-3} \qquad a_{\pi e} - a_e = +0.000\ 000\ 000\ \mathbf{05} \cdot 10^{-3} \tag{27}$$

$$\alpha = 7.297\ 352\ 5693(\mathbf{27}) \cdot 10^{-3} \qquad \alpha_\pi - \alpha = +0.000\ 000\ 00\mathbf{32} \cdot 10^{-3} \tag{28}$$

$$\alpha^{-1} = 137.035\ 999\ 084\ (\mathbf{51}) \qquad \alpha_\pi^{-1} - \alpha^{-1} = -0.000\ 000\ 0\mathbf{61} \tag{29}$$

Source: CODATA data (2010), http://physics.nist.gov/cuu/Constants/index.html

$$a_e = 1.159\ 652\ 180\ 76(\mathbf{27}) \cdot 10^{-3} \qquad a_{\pi e} - a_e = +0.000\ 000\ 000\ \mathbf{03} \cdot 10^{-3} \tag{30}$$

$$\alpha = 7.297\ 352\ 5698(\mathbf{24}) \cdot 10^{-3} \qquad \alpha_\pi - \alpha = +0.000\ 000\ 00\mathbf{27} \cdot 10^{-3} \tag{31}$$

$$\alpha^{-1} = 137.035\ 999\ 074(\mathbf{44}) \qquad \alpha_\pi^{-1} - \alpha^{-1} = -0.000\ 000\ 0\mathbf{51} \tag{32}$$

Initial data for calculation of values of dimensional fundamental physical constants:

$$R_{\infty 2010} = 1.097\ 373\ 156\ 8539(55) \cdot 10^5 \left[sm^{-1}\right]; \qquad c = 2.997\ 924\ 58 \cdot 10^{10} \left[sm \cdot s^{-1}\right] \text{ (Exact)} \tag{33}$$

$$k_R = 1; \qquad k_c = 1;$$

$$R_{\pi\infty} = k_R \cdot R_{\infty 2010} = 1.097\ 373\ 156\ 8539 \cdot 10^5 \left[sm^{-1}\right]; \quad c_\pi = k_c \cdot c = 2.997\ 924\ 58 \cdot 10^{10} \left[sm \cdot s^{-1}\right] \tag{34}$$

The results of theoretical calculations of dimensional fundamental physical constants:

$$\lambda_{\pi C} = 2.426\ 310\ 240\ 7357 \cdot 10^{-10} \left[sm\right] \tag{35}$$

$$m_{\pi e} = 9.109\ 382\ 325\ 3402 \cdot 10^{-28} \left[sm^2\right] \tag{36}$$

$$\frac{m_{\pi e}}{\lambda_{\pi C}^2} = 1.547\ 377\ 464\ 0490 \cdot 10^{-8} \tag{37}$$

$$h_\pi = 6.626\ 069\ 154\ 6231 \cdot 10^{-27} \left[sm^4 \cdot s^{-1}\right] \tag{38}$$

$$\frac{h_\pi}{m_{\pi e}} = 7.273\ 895\ 109\ 4312 \left[sm^2 \cdot s^{-1}\right] \tag{39}$$

$$h_\pi \cdot m_{\pi e} = 6.035\ 939\ 724\ 3606 \cdot 10^{-54} \left[sm^6 \cdot s^{-1}\right] \tag{40}$$

$$\psi_{\pi C} = \frac{m_{\pi e}}{\sqrt{2 \cdot \pi} \cdot m_{\pi p}} = 1.669\ 642\ 831\ 9288 \cdot 10^{-27} \tag{41}$$

$$l_{\pi p} = \lambda_{\pi C} \cdot \frac{\psi_{\pi C}}{\sqrt{2 \cdot \pi}} = 1.616\ 143\ 701\ 6468 \cdot 10^{-33}\ [sm] \tag{42}$$

$$m_{\pi p} = m_{\pi e} \cdot \left(\psi_{\pi C} \cdot \sqrt{2 \cdot \pi}\right)^{-1} = 2.176\ 584\ 070\ 3589 \cdot 10^{-5}\ \left[sm^2\right] \tag{43}$$

$$t_{\pi p} = \frac{l_{\pi p}}{c_{\pi}} = 5.390\ 875\ 115\ 5003 \cdot 10^{-44}\ [s] \tag{44}$$

$$G_{\pi} = \frac{1}{4 \cdot \pi^2} \cdot \frac{h_{\pi} \cdot c_{\pi}}{m_{\pi p}^2} = 6.673\ 380\ 776\ 3121 \cdot 10^{-8}\ \left[sm \cdot s^{-2}\right] \tag{45}$$

Comparison of data

CODATA (2010)

$$\lambda_C = 2.426\ 310\ 2389(\mathbf{16}) \cdot 10^{-10}\ [sm] \qquad \lambda_{\pi C} - \lambda_C = +0.000\ 000\ 00\mathbf{18} \cdot 10^{-10}\ [sm] \tag{46}$$

$$m_e = 9.109\ 382\ 91(\mathbf{40}) \cdot 10^{-28}\ [g] \qquad m_{\pi e} - k_m \cdot m_e = -0.000\ 000\ \mathbf{58} \cdot 10^{-28}\ \left[sm^2\right] \tag{47}$$

$$\frac{m_e}{\lambda_C^2} = 1.547\ 377\ 5657 \cdot 10^{-8}\ \left[g \cdot sm^{-2}\right] \qquad \frac{m_{\pi e}}{\lambda_{\pi C}^2} - \frac{k_m \cdot m_e}{\lambda_C^2} = -0.000\ 000\ 1017 \cdot 10^{-8}\ \left[sm^2 \cdot sm^{-2}\right] \tag{48}$$

$$h = 6.626\ 069\ 57(\mathbf{29}) \cdot 10^{-27}\ \left[sm^2 \cdot g \cdot s^{-1}\right] \qquad h_{\pi} - k_m \cdot h = -0.000\ 000\ \mathbf{42} \cdot 10^{-27}\ \left[sm^4 \cdot s^{-1}\right] \tag{49}$$

$$\frac{h}{m_e} = 7.273\ 895\ 1040(\mathbf{47})\left[sm^2 \cdot s^{-1}\right] \qquad \frac{h_{\pi}}{m_{\pi e}} - \frac{k_m \cdot h}{k_m \cdot m_e} = +0.000\ 000\ 00\mathbf{54}\left[sm^2 \cdot s^{-1}\right] \tag{50}$$

$$m_e \cdot h = 6.035\ 940\ 49 \cdot 10^{-54}\ \left[sm^2 \cdot g^2 \cdot s^{-1}\right] \qquad m_{\pi e} \cdot h_{\pi} - k_m^2 \cdot m_e \cdot h = -0.000\ 000\ 77 \cdot 10^{-54}\ \left[sm^6 \cdot s^{-1}\right] \tag{51}$$

$$G = 6.673\ 84(\mathbf{80}) \cdot 10^{-8}\ \left[sm^3 \cdot g^{-1} \cdot s^{-2}\right] \qquad G_{\pi} - \frac{1}{k_m} \cdot G = -0.000\ \mathbf{46} \cdot 10^{-8}\ \left[sm \cdot s^{-2}\right] \tag{52}$$

CODATA (2006)

$$\lambda_C = 2.426\ 310\ 2175(\mathbf{33})\ \cdot 10^{-10}\ [sm] \qquad \lambda_{\pi C} - \lambda_C = +0.000\ 000\ 0\mathbf{232} \cdot 10^{-10}\ [sm] \tag{53}$$

$$m_e = 9.109\ 382\ 15(\mathbf{45})\ \cdot 10^{-28}\ [g] \qquad m_{\pi e} - k_m \cdot m_e = +0.000\ 000\ \mathbf{18} \cdot 10^{-28}\ \left[sm^2\right] \tag{54}$$

$$\frac{m_e}{\lambda_C^2} = 1.547\ 377\ 4639 \cdot 10^{-8}\ \left[g \cdot sm^{-2}\right] \qquad \frac{m_{\pi e}}{\lambda_{\pi C}^2} - \frac{k_m \cdot m_e}{\lambda_C^2} = +0.000\ 000\ 0001\left[sm^2 \cdot sm^{-2}\right] \tag{55}$$

$$h = 6.626\ 068\ 96(\mathbf{33}) \cdot 10^{-27}\ \left[sm^2 \cdot g \cdot s^{-1}\right] \qquad h_{\pi} - k_m \cdot h = +0.000\ 000\ \mathbf{19} \cdot 10^{-27}\ \left[sm^4 \cdot s^{-1}\right] \tag{56}$$

$$\frac{h}{m_e} = 7.273\ 895\ 040(\mathbf{10})\left[sm^2 \cdot s^{-1}\right] \qquad \frac{h_{\pi}}{m_{\pi e}} - \frac{k_m \cdot h}{k_m \cdot m_e} = +0.000\ 000\ 0\mathbf{69}\left[sm^2 \cdot s^{-1}\right] \tag{57}$$

$$m_e \cdot h = 6.035\ 939\ 43 \cdot 10^{-54}\ \left[sm^2 \cdot g^2 \cdot s^{-1}\right] \qquad m_{\pi e} \cdot h_{\pi} - k_m^2 \cdot m_e \cdot h = +0.000\ 000\ 29 \cdot 10^{-54}\ \left[sm^6 \cdot s^{-1}\right] \tag{58}$$

$$G = 6.674\ 28(\mathbf{67}) \cdot 10^{-8}\ \left[sm^3 \cdot g^{-1} \cdot s^{-2}\right] \qquad G_{\pi} - \frac{1}{k_m} \cdot G = -0.000\ \mathbf{90} \cdot 10^{-8}\ \left[sm \cdot s^{-2}\right] \tag{59}$$

CODATA (2002)

$$\lambda_C = 2.426\ 310\ 238(\mathbf{16}) \cdot 10^{-10}\ [sm] \qquad \lambda_{\pi C} - \lambda_C = +0.000\ 000\ 00\mathbf{3} \cdot 10^{-10}\ [sm] \tag{60}$$

$$m_e = 9.109\ 3826(\mathbf{16}) \cdot 10^{-28}\ [g] \qquad m_{\pi e} - k_m \cdot m_e = -0.000\ 00\mathbf{27} \cdot 10^{-28}\ \left[sm^2\right] \tag{61}$$

$$\frac{m_e}{\lambda_C^2} = 1.547\ 3775 \cdot 10^{-8}\ \left[g \cdot sm^{-2}\right] \qquad \frac{m_{\pi e}}{\lambda_{\pi C}^2} - \frac{k_m \cdot m_e}{\lambda_C^2} = -0.000\ 0001 \cdot 10^{-8}\ \left[sm^2 \cdot sm^{-2}\right] \tag{62}$$

$$h = 6.626\ 0693(\mathbf{11}) \cdot 10^{-27}\ \left[sm^2 \cdot g \cdot s^{-1}\right] \qquad h_{\pi} - k_m \cdot h = -0.000\ 000\mathbf{1} \cdot 10^{-27}\ \left[sm^4 \cdot s^{-1}\right] \tag{63}$$

$$\frac{h}{m_e} = 7.273\ 895\ 101(\mathbf{48})\left[sm^2 \cdot s^{-1}\right] \qquad \frac{h_\pi}{m_{\pi e}} - \frac{k_m \cdot h}{k_m \cdot m_e} = +0.000\ 000\ 00\mathbf{8}\left[sm^2 \cdot s^{-1}\right] \tag{64}$$

$$m_e \cdot h = 6.035\ 9400 \cdot 10^{-54}\left[sm^2 \cdot g^2 \cdot s^{-1}\right] \qquad m_{\pi e} \cdot h_\pi - k_m^2 \cdot m_e \cdot h = -0.000\ 0003 \cdot 10^{-54}\left[sm^6 \cdot s^{-1}\right] \tag{65}$$

$$G = 6.6742(\mathbf{10}) \cdot 10^{-8}\left[sm^3 \cdot g^{-1} \cdot s^{-2}\right] \qquad G_\pi - \frac{1}{k_m} \cdot G = -0.000\mathbf{8} \cdot 10^{-8}\left[sm \cdot s^{-2}\right] \tag{66}$$

CODATA (1998)

$$\lambda_C = 2.426\ 310\ 215(\mathbf{18}) \cdot 10^{-10}\ \ [sm] \qquad \lambda_{\pi C} - \lambda_C = +0.000\ 000\ 0\mathbf{26} \cdot 10^{-10}\left[sm\right] \tag{67}$$

$$m_e = 9.109\ 381\ 88(\mathbf{72}) \cdot 10^{-28}\ \ [g] \qquad m_{\pi e} - k_m \cdot m_e = +0.000\ 000\ \mathbf{45} \cdot 10^{-28}\left[sm^2\right] \tag{68}$$

$$\frac{m_e}{\lambda_C^2} = 1.547\ 377\ 42 \cdot 10^{-8}\left[g \cdot sm^{-2}\right] \qquad \frac{m_{\pi e}}{\lambda_{\pi C}^2} - \frac{k_m \cdot m_e}{\lambda_C^2} = +0.000\ 000\ 04 \cdot 10^{-8}\left[sm^2 \cdot sm^{-2}\right] \tag{69}$$

$$h = 6.626\ 068\ 76(\mathbf{52}) \cdot 10^{-27}\left[sm^2 \cdot g \cdot s^{-1}\right] \qquad h_\pi - k_m \cdot h = +0.000\ 000\ \mathbf{39} \cdot 10^{-27}\left[sm^4 \cdot s^{-1}\right] \tag{70}$$

$$\frac{h}{m_e} = 7.273\ 895\ 032(\mathbf{53})\left[sm^2 \cdot s^{-1}\right] \qquad \frac{h_\pi}{m_{\pi e}} - \frac{k_m \cdot h}{k_m \cdot m_e} = +0.000\ 000\ 0\mathbf{77}\left[sm^2 \cdot s^{-1}\right] \tag{71}$$

$$m_e \cdot h = 6.035\ 939\ 07 \cdot 10^{-54}\left[sm^2 \cdot g^2 \cdot s^{-1}\right] \qquad m_{\pi e} \cdot h_\pi - k_m^2 \cdot m_e \cdot h = +0.000\ 000\ 65 \cdot 10^{-54}\left[sm^6 \cdot s^{-1}\right] \tag{72}$$

$$G = 6.673(10) \cdot 10^{-8}\left[sm^3 \cdot g^{-1} \cdot s^{-2}\right] \qquad G_\pi - \frac{1}{k_m} \cdot G = 0.0\mathbf{00} \cdot 10^{-8}\left[sm \cdot s^{-2}\right] \tag{73}$$

CODATA (1986)

$$\lambda_C = 2.426\ 310\ 58(\mathbf{22}) \cdot 10^{-10}\left[sm\right] \qquad \lambda_{\pi C} - \lambda_C = +0.000\ 000\ \mathbf{34} \cdot 10^{-10}\left[sm\right] \tag{74}$$

$$m_e = 9.109\ 3897(\mathbf{54}) \cdot 10^{-28}\ \ [g] \qquad m_{\pi e} - k_m \cdot m_e = -0.000\ 00\mathbf{74} \cdot 10^{-28}\left[sm^2\right] \tag{75}$$

$$\frac{m_e}{\lambda_C^2} = 1.547\ 378\ 284 \cdot 10^{-8}\left[g \cdot sm^{-2}\right] \qquad \frac{m_{\pi e}}{\lambda_{\pi C}^2} - \frac{k_m \cdot m_e}{\lambda_C^2} = -0.000\ 000\ 812 \cdot 10^{-8}\left[sm^2 \cdot sm^{-2}\right] \tag{76}$$

$$h = 6.626\ 0755(\mathbf{40}) \cdot 10^{-27}\left[sm^2 \cdot g \cdot s^{-1}\right] \qquad h_T - k_m \cdot h = -0.000\ 00\mathbf{63} \cdot 10^{-27}\left[sm^4 \cdot s^{-1}\right] \tag{77}$$

$$\frac{h}{m_e} = 7.273\ 896\ 14(\mathbf{65})\left[sm^2 \cdot s^{-1}\right] \qquad \frac{h_\pi}{m_{\pi e}} - \frac{k_m \cdot h}{k_m \cdot m_e} = -0.000\ 00\mathbf{1\ 03}\left[sm^2 \cdot s^{-1}\right] \tag{78}$$

$$m_e \cdot h = 6.035\ 9504 \cdot 10^{-54}\left[sm^2 \cdot g^2 \cdot s^{-1}\right] \qquad m_{\pi e} \cdot h_\pi - k_m^2 \cdot m_e \cdot h = -0.000\ 0108 \cdot 10^{-54}\left[sm^6 \cdot s^{-1}\right] \tag{79}$$

$$G = 6.672\ 59(\mathbf{85}) \cdot 10^{-8}\left[sm^3 \cdot g^{-1} \cdot s^{-2}\right] \qquad G_\pi - \frac{1}{k_m} \cdot G = +0.000\ \mathbf{79} \cdot 10^{-8}\left[sm \cdot s^{-2}\right] \tag{90}$$

CODATA (2010)

$$l_p = 1.616\ 199\,(\mathbf{97})\ \cdot 10^{-33}\left[sm\right] \qquad l_{\pi p} - l_p = -0.000\ 0\mathbf{55} \cdot 10^{-33}\left[sm\right] \tag{91}$$

$$m_p = 2.176\ 51(\mathbf{13})\ \cdot 10^{-33}\left[g\right] \qquad m_{\pi p} - k_m \cdot m_p = +0.000\ \mathbf{07} \cdot 10^{-5}\left[sm^2\right] \tag{92}$$

$$t_p = 5.391\ 06\,(\mathbf{32})\ \cdot 10^{-44}\left[s\right] \qquad t_{\pi p} - t_p = -0.000\ \mathbf{18} \cdot 10^{-44}\left[s\right] \tag{93}$$

$$\psi_C = \frac{m_e}{\sqrt{2 \cdot \pi} \cdot m_p} = 1.669\ 70 \cdot 10^{-23} \qquad \psi_{\pi C} - \psi_C = -0.000\ 06 \cdot 10^{-23} \tag{94}$$

Conclusions:

No doubt about the experimental data (24), (27) and (30). It takes only a further increase in accuracy.

Questionable estimates (28) and (31). It is recommended to count α.

Questionable data (47) and (49). It is recommended to recheck the values of constants h and m_e.