Form of the interference field is non-linear

Lubomir Vlcek

Rokytov 132, 086 01, Slovak Republic

Email: lubomir.vlcek@gmail.com

1.Abstract

The main differences between incompetent Einstein's theory[1] and the latest knowledge[2]are:

1.Form of Intensity of the Moving Charge Electric Field is asymmetrical,

2. Form of the interference field is non-linear,

3. Kinetic energy of a charge moving at the velocity of *v* **has two different values:**
Kinetic energy of electron , (proton)

$T_{kin\ id}$ =mc^2 [ln |1-v/c|+ (v/c) / (1-v/c)] in direction of motion of electron, (proton)

where v is velocity of electron, (proton).

Kinetic energy of electron , (proton)

$T_{kin\ ad}$ = mc^2 [ln |1+v/c|- (v/c) / (1+v/c)] against direction of motion of electron, (proton)

where v is velocity of electron, (proton).

These are the main differences between incompetent Einstein's theory and the latest knowledge.

2.Shortened theory

2.2 The non-linear form of the interference field

Until recently it has been assumed that the shape of the interference field is "linear". The corresponding fraction of the shift of the interference fringes is directly proportional to the corresponding part of the wave length. If, for example, the distance of two interference fringes is divided into 100 divisions and the shift of 23 divisions is detected, we thus assume that the change occured over a length of $\frac{23}{100} \cdot \frac{\lambda}{2}$.

In other words, the shift of the fringes is considered to be equivalent to the change of length. This view corresponds to the linear form of the interference field, see Fig. 2.12.

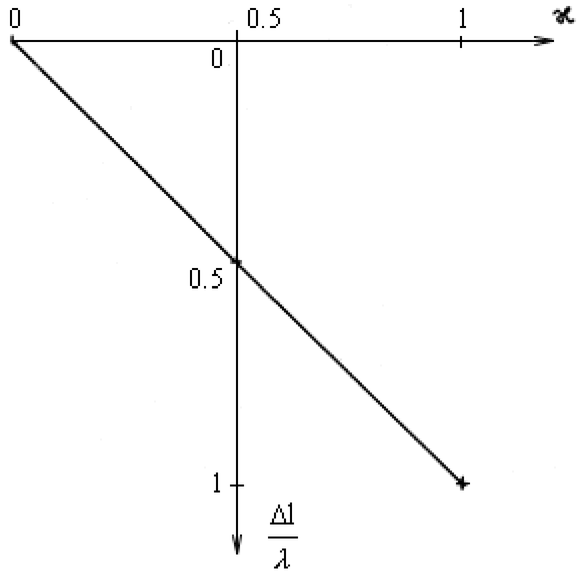

Fig. 2.12. The "linear" form of the interference field

What justifies us our assumption that the interference field is linear? Is the assumption correct?

In physics we are used to picture the experimental results through curves which are not "saw-tooth" as is the case with the linear interference field, but which have a nicely rounded shape. Let us replace the "saw-tooth" linear interference field by some rounded non-linear interference field.

Let us choose sinusoides or semi-circles instead of the sawtooth abscissas. In case of semi-circles according to Fig. 2.13 we get:

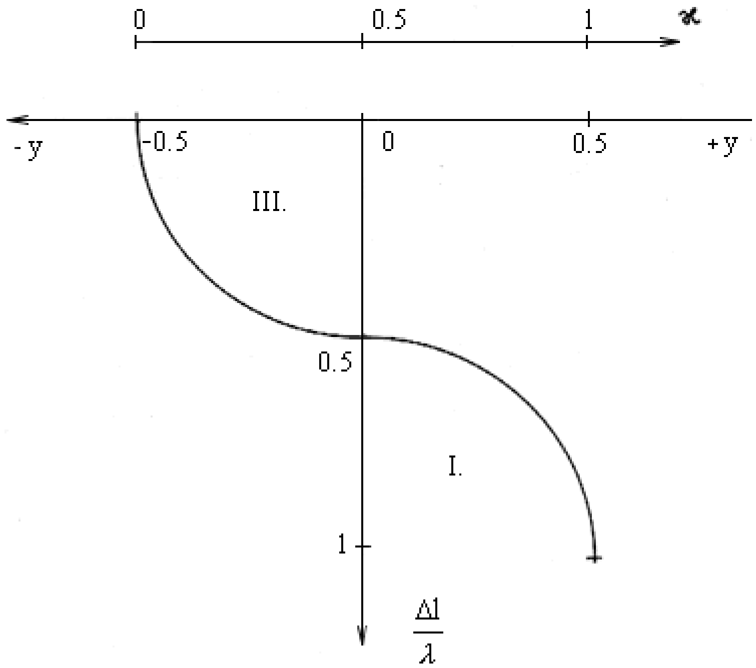

Fig. 2.13. The non-linear form of the interference field

in the 3rd quadrant: $y^2 + \left(\frac{\Delta l}{\lambda}\right)^2 = 0.5^2$, as

$\kappa - 0.5 = y \qquad \kappa^2 - \kappa + 0.5^2 + \left(\frac{\Delta l}{\lambda}\right)^2 = 0.5^2$

$$\kappa_{12} = 0.5 \pm \sqrt{\left[0.25 - \left(\frac{\Delta l}{\lambda}\right)^2\right]} \tag{2.46}$$

In the shifted 1st quadrant

$(\kappa - 0.5)^2 + \left(\frac{\Delta l}{\lambda} + 1\right)^2 = 0.5^2$

$$\kappa_{12} = 0.5 \pm \sqrt{\left[0.25 - \left(\frac{\Delta l}{\lambda} + 1\right)^2\right]} \tag{2.47}$$

2.2.1. Fizeau's Experiment

Let us revalue the results of the Fizeau's experiment from the aspect of non-linear interference field. Fizeau [6] used light of wave length $\lambda = 0.526\ \mu m$, two tubes, each L=1.4875 m long in which water flowed at speed u=7.059 m/s. As the experiment is generally known, we shall not describe it in detail. We shall only reassess its results.

The relation $\frac{\Delta l}{\lambda} = 0.4103$ corresponds to equal values of the shift of fringe κ supposing the interference field to be linear. In reality the experimentally observed values from the interval ranged from 0.167 to 0.307 in the average of $\bar{\kappa} = 0.23016$. That was explained by Fresnel's theory of partial drag of ether with the drag coefficient α. Should we consider the non-linear form of the interference field, then according to (2.46) we get

$$\kappa = 0.5 \pm \sqrt{(0.25 - 0.41^2)} = 0.22$$

which is in line with the experimentally observed mean value $\bar{\kappa}$. We do not need any coefficient α. Fizeau's experiment confirms also that the interference field has a non-linear form.

2.2.2. Harres's Experiment

Harres [7] used two wavelengths of light

$\lambda_{625} = 0.625\,\mu\mathrm{m}$ $\lambda_{535} = 0.535\,\mu m$

which were passing through ten firmly fastened prisms in a rotating apparatus at speed 400-600 revolutions/min. According to [7], if the drag coefficient $x = \alpha$ is not included

$$\frac{\Delta l}{\lambda} = \frac{200\,n^2\pi}{z_m \lambda c} 0.20409 + \frac{200\,\pi}{z_m \lambda c} 0.00188$$

were $z_m = 0.99727z$, z - is the number of sideral time seconds required by the apparatus to make 50 revolutions.

After the arrangement

$$\frac{\Delta l}{\lambda_{625}} = \frac{1.70148214}{z} \qquad (2.48)$$

$$\frac{\Delta l}{\lambda_{535}} = \frac{2.00028242}{z} \qquad (2.49)$$

The average value $\bar{z} = 5.11$ (tab. 1) after substitution in (2.48) gives

$$\frac{\Delta l}{\lambda_{625}} = 0.333$$

Substituing $\frac{\Delta l}{\lambda}$ to (2.46) we get

$$\kappa = 0.5 - 0.3755 = 0.1245$$

According to the experiment $\kappa_{\text{Harres}} = 0.132$ is again in line with the theory of the non-linear interference field. The comparison of Harres's experimental values that do not include the drag coefficient α with both linear and non-linear form of the interference field, as well as the results of Fizeau's experiment, are shown in Fig. 2.14.-2.21.

Fig. 2.14.-2.21. The comparison of Harre's experimental values which do not comprise the drag coefficient with both linear and non-linear form of the interference field, as well as the results of Fizeau's experiment.

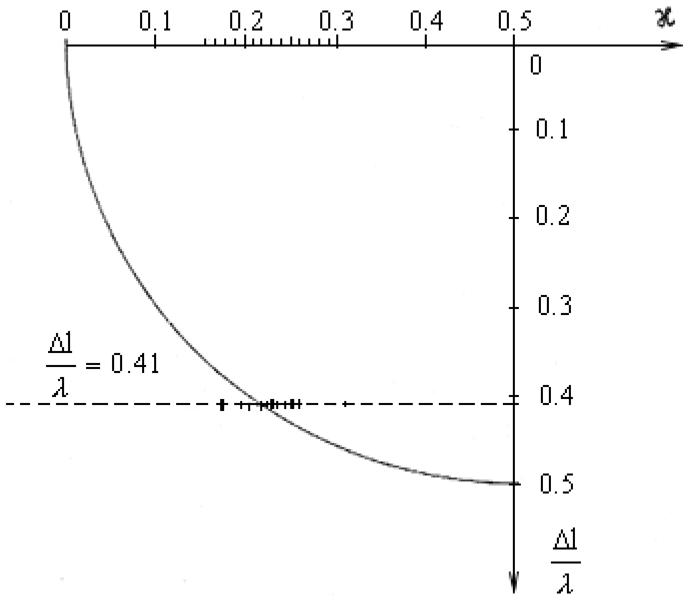

Fig. 2.14. Fizeau's experiment [6] p. 392

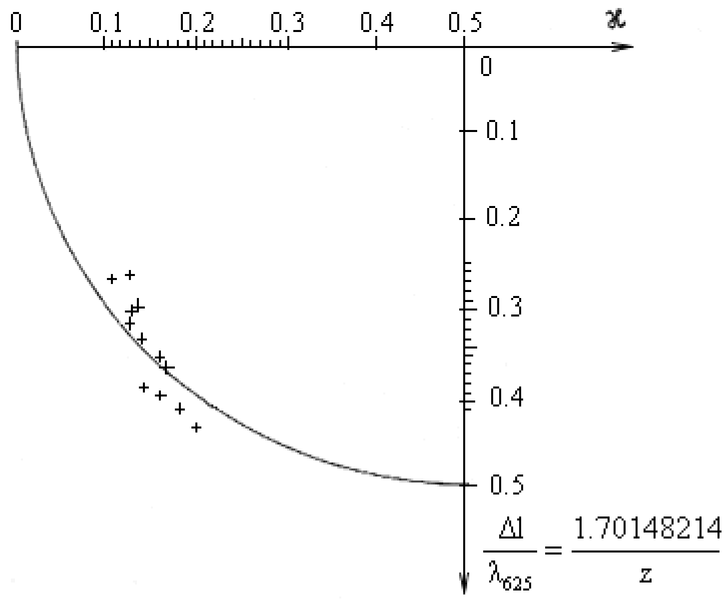

Fig. 2.15. [7] Tab. 1., 1. Reihe

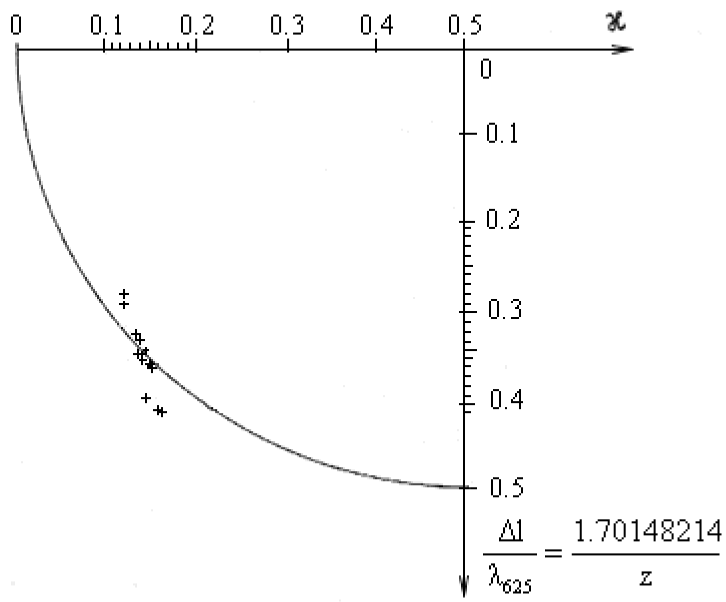

Fig. 2.16. [7] Tab. 1., 2. Reihe

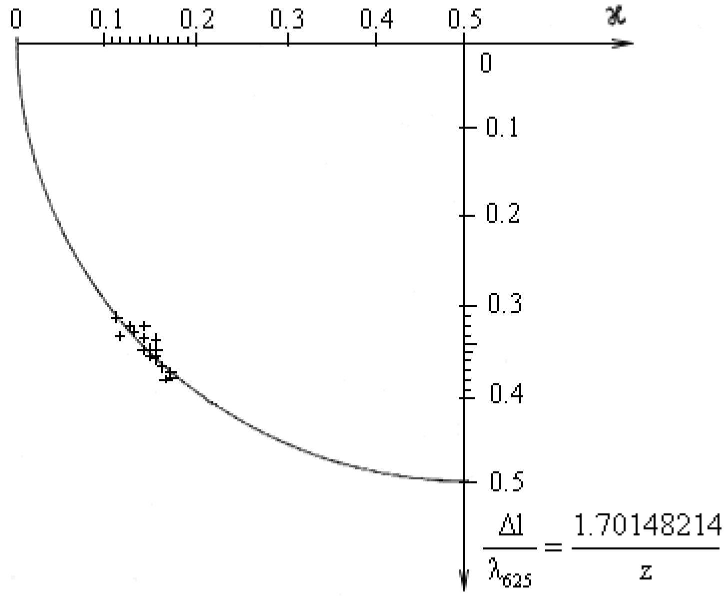

Fig. 2.17. [7] Tab. 1., 3. Reihe

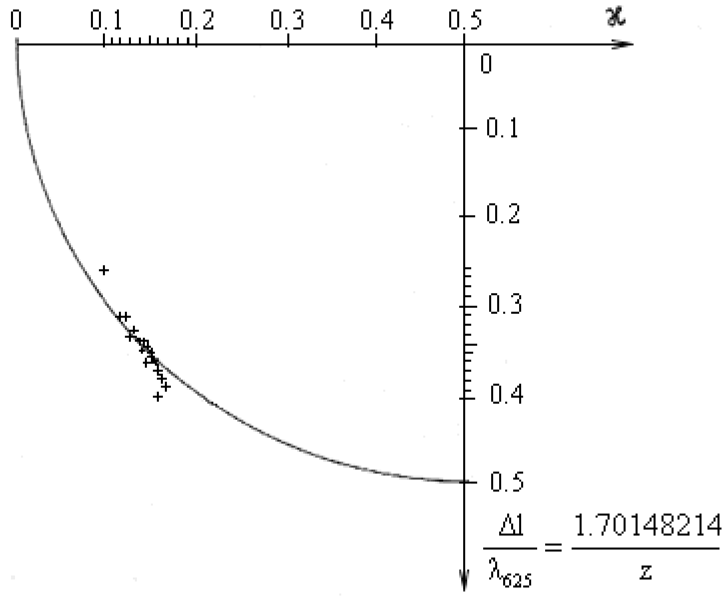

Fig. 2.18. [7] Tab. 1., 4. Reihe

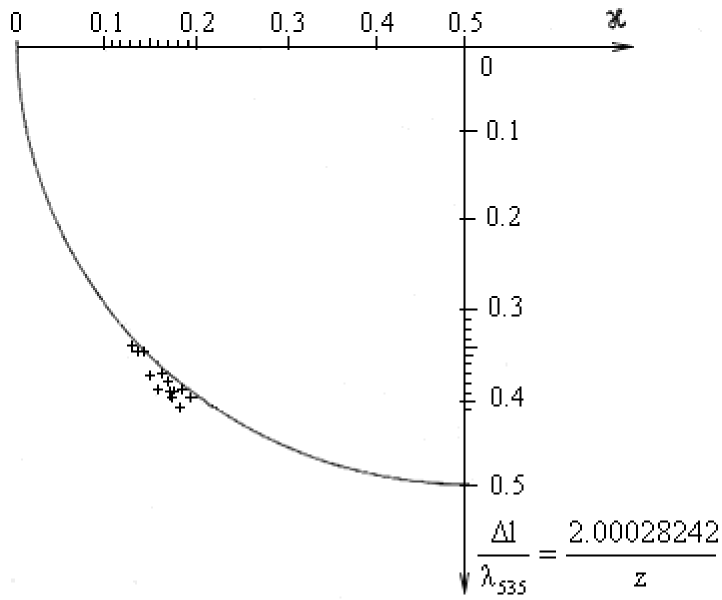

Fig. 2.19. [7] Tab. 2., 1. Reihe

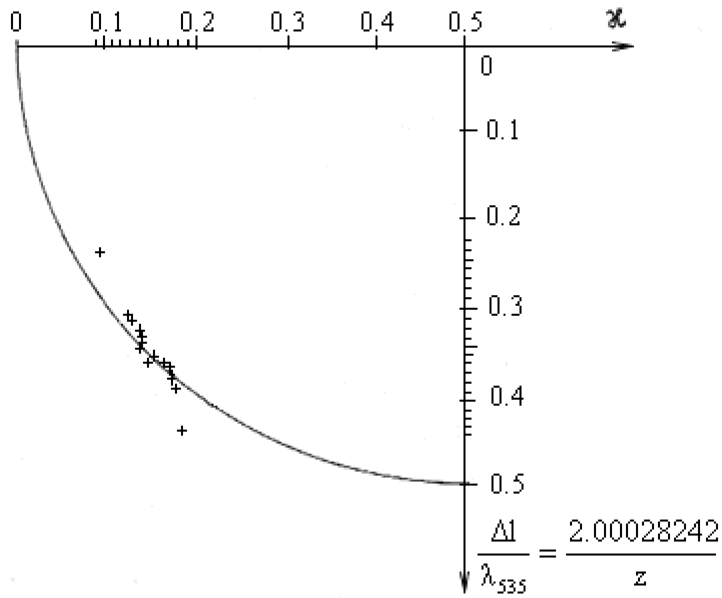

Fig. 2.20. [7] Tab. 2., 2. Reihe

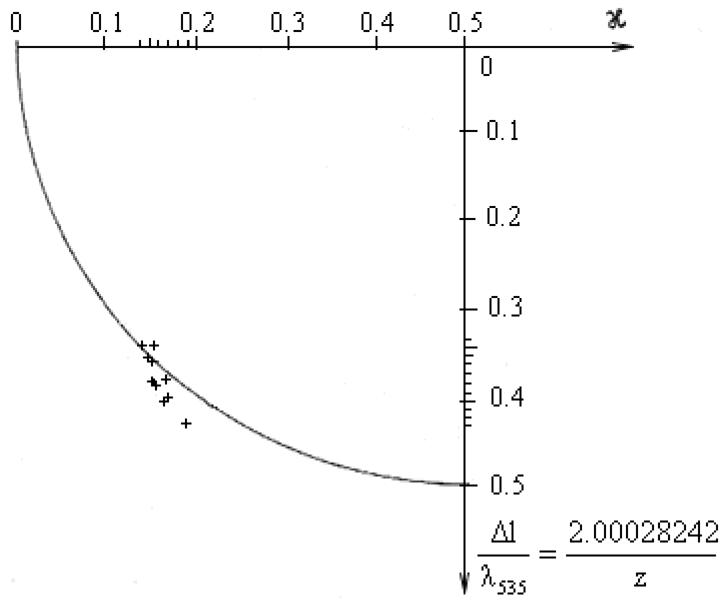

Fig. 2.21. [7] Tab. 2., 3. Reihe

This is simultaneously proves that the drag coefficient always equals one and the interference field has a non-linear form. Consequently, the interference fields are identical only for the shift of the interference fringes about 0 and/or 100 and 50 divisions.

Consequence : Form of the interference field is non-linear: (from [2] pages 34 – 39).

3. Calculation of the kinetic energy T_{kin} of a body moving at the velocity of v

For the sake of simplicity let us consider for instance the gravitational field of the Earth. Analogically to (2.20) for the intensity of the gravitational field one could write:

$$g_{\mathrm{mov}} = g_{\mathrm{still}}\left(1 - \frac{v}{c}\cos\vartheta\right)^2 \qquad (3.1)$$

Let us consider the physical processes in which kinetic energy is transformed into potential one and potential energy is transformed into kinetic one. There is a state in which the potential energy equals total energy of the body (while the kinetic energy equals zero) and the state in which kinetic energy equals the total energy of the body (while the potential energy equals zero). These extreme will help us to calculate the kinetic energy of body. For the potential energy we have

$$\mathrm{d}W_{\mathrm{p}} = m g_{\mathrm{still}}\,\mathrm{d}h \qquad (3.2)$$

By integrating and utilizing of the relation (3.1) we have

$$T_{\text{kin}} = \int \mathrm{d}W_p = \int_0^h m g_{\text{still}} \mathrm{d}h = \int_0^h m \frac{g_{mov}}{\left(1-\frac{v}{c}\cos\vartheta\right)^2} \mathrm{d}h$$

By substituting $g_{\text{mov}} = \frac{\mathrm{d}v}{\mathrm{d}t}$, $\frac{\mathrm{d}h}{\mathrm{d}t} = v$

we get

$$T_{\text{kin}} = m\int_0^v \frac{v\mathrm{d}v}{\left(1-\frac{v}{c}\cos\vartheta\right)^2} \tag{3.3}$$

Solving by substitution $1-\frac{v}{c}\cos\vartheta = z$

we get

$$T_{\text{kin}} = \frac{mc^2}{\cos^2\vartheta}\left[\ln\left|1-\frac{v}{c}\cos\vartheta\right| + \frac{\frac{v}{c}\cos\vartheta}{1-\frac{v}{c}\cos\vartheta}\right] \tag{3.4}$$

while ϑ isn't $\frac{\pi}{2}$, $\frac{3\pi}{2}$

For $\vartheta = 0°$ we have the kinetic energy in the direction of motion

$$T_{\text{kin}_d} = mc^2\left[\ln\left|1-\frac{v}{c}\right| + \frac{\frac{v}{c}}{1-\frac{v}{c}}\right] \tag{3.5}$$

For $\vartheta = 180°$ we have the kinetic energy against the direction of motion

$$T_{\text{kin}_{ad}} = mc^2\left[\ln\left|1+\frac{v}{c}\right| - \frac{\frac{v}{c}}{1+\frac{v}{c}}\right] \tag{3.6}$$

If $0 < \frac{v}{c} = x << 1$ (i.e. $v<<c$)

utilizing the series $\ln(1 \pm x)$ $(1 \pm x)^{-1}$

the equations (3.5) and (3.6)will be changed in the equation $T_{kin_{ad}} = T_{kin_{id}} = \frac{1}{2} m v^2$

complying with the Newton's mechanics. In Table 2 the values of the kinetic energy are

$T_{kin_{ad}}$, $T_{kin_{id}}$. The total energy according to Einstein $\frac{m_0 c^2}{\sqrt{1 - \frac{v^2}{c^2}}}$.

Table 2. Calculation of the kinetic energy T_{kin} of a body moving at the velocity of v according to Vlcek and according to Einstein

v/c	Vlcek ´s theory - **kinetic energy** against direction of motion as wave $T_{kin\ ad}$ = $mc^2[\ln\ |1+v/c| - (v/c)/(1+v/c)]$	Vlcek ´s theory – **kinetic energy** in direction of motion as particle $T_{kin\ id}$ = $mc^2[\ln\ |1-v/c| + (v/c)/(1-v/c)]$	Vlcek ´s theory $m = m_0 = const$ $(T_{k\ ad} + T_{k\ id})/2$	Einstein ´s theory T_{kin} = $mc^2 - m_0 c^2$
0.1	0.00439 mc^2	0.0057 mc^2	0.0050 $m c^2$	0.0050 $m c^2$
0.2	0.0156 mc^2	0.0268 mc^2	0.0212 $m c^2$	0.0200 $m c^2$
0.3	0.0316 mc^2	0.0719 mc^2	0.0517 $m c^2$	0.0480 $m c^2$
0.4	0.0508 mc^2	0.1558 mc^2	0.1033 $m c^2$	0.0910 $m c^2$
0.5	0.0722 mc^2	0.3068 mc^2	0.1895 $m c^2$	0.1550 $m c^2$
0.6	0.0950 mc^2	0.5837 mc^2	0.3393 $m c^2$	0.2500 $m c^2$
0.7	0.1174 mc^2	1.1293 mc^2	0.6233 $m c^2$	0.4010 $m c^2$
0.8	0.1434 mc^2	2.3905 mc^2	1.2669 $m c^2$	0.6670 $m c^2$
0.9	0.1680 mc^2	6.6974 mc^2	3.4327 $m c^2$	1.2930 $m c^2$
0.99	0.1906 mc^2	94.3948 mc^2	47.294 $m c^2$	6.9200 $m c^2$
1.0	0.1931 mc^2	infinite	infinite	infinite

Direct measurement of the speed in the experiments Kirchner[3], [4], Perry, Chaffee [5]

For v/c = 0.08-0.27 can not yet prove the validity of Vlcek's theory[2] or Einstein's theory[1].

Consequence.

The main differences between incompetent Einstein's theory[1] and the latest knowledge[2]are:
1.Form of Intensity of the Moving Charge Electric Field is asymmetrical,
2. Form of the interference field is non-linear,
3. Kinetic energy of a charge moving at the velocity of v has two different values:
Kinetic energy of electron , (proton)
Tkin id =mc2 [ln |1-v/c|+ (v/c) / (1-v/c)] in direction of motion of electron, (proton)

where v is velocity of electron, (proton).
Kinetic energy of electron , (proton)
Tkin ad = mc2 [ln |1+v/c|- (v/c) / (1+v/c)] against direction of motion of electron, (proton)
where v is velocity of electron, (proton).
These are the main differences between incompetent Einstein's theory and the latest knowledge.

Vlcek simplifies knowledge in physics:
Baryons (and mesons) are protons (or alpha particles) with different speeds.
In direction of motion of the proton (or alpha particle) = baryon,
against the direction of motion of the proton (or alpha particle) = meson.
Leptons (and neutrinos) are electrons with different speeds .
In direction of motion of the electron = lepton,
against the direction of motion of the electron = neutrino.
Consider the experiments at CERN and particle decay mode see [9] , [10] and [11].

References

[1] A. Einstein : Sobranie naucnych trudov v cetyrech tomach pod redakciej I. E.TAMMA, Ja. A. SMORODINSKOGO, B. G. KUZNECOVA, Izdatelstvo "Nauka", Moskva 1966

[2] L. Vlcek, : New Trends in Physics, Slovak Academic Press, Bratislava 1996, ISBN 80-85665-64-6. Presentation on European Phys. Soc. 10th Gen. Conf. – Trends in Physics (EPS 10) Sevilla , E 9 -13 September 1996

[3] F. Kirchner : Über die Bestimmung der spezifischen Ladung des Elektrons aus Geschwindigkeitsmessungen, Ann. d. Physik [5] **8**, 975 (1931)

[4] F. Kirchner : Zur Bestimmung der spezifischen Ladung des Elektrons aus Geschwindigkeitsmessungen , Ann. d. Physik [5] **12**, 503 (1932)

[5] Ch. T. Perry, E.L. Chaffee : A DETERMINATION OF e/m FOR AN ELECTRON BY DIRECT MEASUREMENT OF THE VELOCITY OF CATHODE RAYS , Phys.Rev.**36**,904 (1930)

[6] FIZEAU, M. H.: Sur les hypothéses relatives a l'éther lumineux. Ann. de Chim. et de Phys., 3e série, T. LVII. (Décembre 1859) Présente á l'Academie des Sciences dans sa séance du 29 septembre 1851.

[7] KNOPF, O.: Annalen der Physik, Vierte folge, Band 62, 1920 :"Die Versuche von F. Harress uber die Geschwindigkeit des Lichtes in bewegten Korpern, von O. Knopf. p. 391 – 447

[8] KAUFMANN, W.: Annalen der Physik, Vierte Folge, Band 19, Leipzig, 1906 Verlag von Johann Ambrosius Barth p. 487-552

[9] Great table of elementary particles. http://www.trendsinphysics.info/

[10] K Nakamura *et al* (Particle Data Group) 2010 *J. Phys. G: Nucl. Part. Phys.* **37** 075021

[11] Particles, waves and trends in physics http://www.trendsinphysics.info/

http://vixra.org/pdf/1409.0090v1.pdf ,

http://vixra.org/author/lubomir_vlcek

https://tuke.academia.edu/LubomirVlcek

http://www.trendsinphysics.info/