

# Neutrino Oscillations.

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**Abstract.** *In the present paper we show, that leptons ( electron, muon, tau ), W + - Z bosons and neutrinos ( electron neutrino , muon neutrino, tau neutrino) can be replaced with electron moving at different speeds from 0.1c up to 0.999.. c .*

Keywords: mass, kinetic energy, electron . leptons, neutrino.

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## Introduction

Calculation of the kinetic energy of a body moving at the velocity of  $v$  , [4] p. 51-52:

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

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

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

$$T_{kin_d} = mc^2 \left[ \ln \left| 1 - \frac{v}{c} \right| + \frac{\frac{v}{c}}{1 - \frac{v}{c}} \right]$$

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

$$T_{kin_a} = mc^2 \left[ \ln \left| 1 + \frac{v}{c} \right| - \frac{\frac{v}{c}}{1 + \frac{v}{c}} \right]$$

## Calculations

Leptons ( electron, muon, tau ), W + - Z bosons and neutrinos ( electron neutrino , muon neutrino, tau neutrino) can be replaced with electron moving at different speeds from 0.1c up to 0.999.. c :

ELECTRON	Front of elektron	Behind elektron
$v/c$	$\left[ \ln \left  1 - \frac{v}{c} \right  + \frac{\frac{v}{c}}{1 - \frac{v}{c}} \right]$	$\left[ \ln \left  1 + \frac{v}{c} \right  - \frac{\frac{v}{c}}{1 + \frac{v}{c}} \right]$
	<b>kinetic energy of elektron in direction of motion of electron</b>	<b>kinetic energy of elektron against direction of motion of electron</b>
0,0799086445 Kirchner for U=1638,0 V	0,00356628385160740599059464	0,002880704300671056313624878
0,082238621 Kirchner for U =1735,96V	0,00378998886663387919657356	0,003042332317770319169080784
0,202205081 Perry,Chaffee for U =10761,7090 V	0,02755125385653292262096002	0,015962273832949665428498873
0,269608445 Perry,Chaffee for U =19623,6459 V	0,05495413305133968524372351	0,026352956168022961852416332
<b>0,682155567100 Electron</b>	1,000000000000000000000000000002 <b>0,510998909972495983961273 MeV</b>	0,114551385035970519154979 <b>58,535632889220622949041233 keV</b>
0,995308032046	206,768282237446856567451897 Muon 105,658366838 MeV = = kinetic energy of elektron in direction of motion of electron	0,19197419073094806197627099 Muon neutrino 98,0986022063665017156014 keV = kinetic energy of elektron against direct of motion of electron < 170 keV
<b>0,99971316674</b>	3477,188943975939984866353 <b>Tauon 1776,84±0.17 MeV = kinetic energy of elektron in direction of motion of electron</b>	0,193075472235437055495057927 <b>Muon neutrino</b> 98,09883233061547455 keV = kinetic energy of elektron against direction of motion of electron < 170 keV
<b>0,999993644657</b>	157334,9735801341408669551922 W+ BOSON = 80 398±0.25 MeV	0,19314559172439827476506281953 Muon neutrino <b>98,697186837160259 keV &lt; 170 keV</b>
<b>0,9999943965909</b>	178449,69572422000527027492336062 BOSÓN Z = 91 187,6 MeV	0,19314577970768356308259999253441 Muon neutrino <b>98,6972828964141347372 keV &lt; 170 keV</b>
<b>0,99999364465</b>	157334,97358013414086695519224486 <b>W+ BOSON = 80 398±0.25 MeV = kinetic energy of elektron in direction of motion of electron</b>	0,19314559172439827476506281953288 Muon neutrino < 170 keV = 0,17 MeV <b>98,697186837160259358230511606622 keV = kinetic energy of elektron against direction of motion of electron &lt; 170 keV</b>

## Mass is not depends on velocity.

Contemporary physics states:

(charge / mass) depends on velocity .

By changing the intensity of a moving charge, is change the force.

Force= charge x intensity =  $e E_e = F_e$

Force= mass x intensity of Gravitation Field =  $m g = F_g$

For standstill charge :

$$e E_{e \text{ still}} = F_{e \text{ still}}$$

$$m g_{\text{ still}} = F_{g \text{ still}}$$

$$e/m = F_{e \text{ still}} g_{\text{ still}} / E_{e \text{ still}} F_{g \text{ still}}$$

For moving charge :

$$e E_{e \text{ mov}} = e E_{e \text{ still}} (1-v/c)^2 = F_{e \text{ mov}}$$

$$m g_{\text{ mov}} = m g_{\text{ still}} (1-v/c)^2 = F_{g \text{ mov}}$$

$$F_{e \text{ mov}} / F_{g \text{ mov}} = e E_{\text{ still}} / m g_{\text{ still}} = F_{e \text{ still}} / F_{g \text{ still}}$$

$$e/m = F_{e \text{ mov}} g_{\text{ mov}} / E_{\text{ mov}} F_{g \text{ mov}} =$$

$$= e E_{e \text{ still}} (1-v/c)^2 g_{\text{ still}} (1-v/c)^2 / E_{e \text{ still}} (1-v/c)^2 m g_{\text{ still}} (1-v/c)^2 =$$

$$= F_{e \text{ still}} g_{\text{ still}} / E_{e \text{ still}} F_{g \text{ still}} = e/m$$

$e/m$  is always constant. Are changed only intensities of Electrical and Gravitational Fields.

Mass is constant. Total mass is totally wrong termin.

Rest mass is only mass:  $m_0 = m = \text{constant}$ .

EINSTEIN:  $eU = mc^2 - m_0 c^2 = \text{kinetical energy}$

VLCEK:  $eU = \text{kinetical energy/of particle} / = mc^2 [\ln |1-v/c| + (v/c) / (1-v/c)]$  in direction of motion

$eU = \text{kinetical energy/of wave: photon, boson, gluon, gama ray, medium, enviroment in which wave ispropagated} / = mc^2 [\ln |1+v/c| - (v/c) / (1+v/c)]$  against direction of motion

## Consequences

Solar neutrinos originate from the nuclear fusion powering the Sun and other stars. The details of the operation of the Sun we can explain.

In short, when four protons fuse to become one helium nucleus, two of which must be converted into neutrons, and each such transition depends on the penetration of the two electrons from the Universe, to the interior of the Sun.

kinetical energy/of electron /  $E_e = mc^2 [\ln |1-v/c| + (v/c) / (1-v/c)]$  in direction of motion of electron (from the Universe, to the interior of the Sun), where  $v$  is velocity of electron

kinetical energy/of wave =of electron neutrinos /=

$E_w = mc^2 [\ln |1+v/c| - (v/c) / (1+v/c)]$  against direction of motion of electron (from the interior of the Sun, to the Universe), where  $v$  is velocity of electron

1. When electrons from the Universe have velocity  $v = 0,6c$ , then

radius of force reach of electron  $r_e$  [4] p. 55-61:

$r_e = 7,7242296915076524984672268696567e-16m$  in direction of motion of electron

from the Universe, to the interior of the Sun,

$r_e = 7,5933174273225751416275418610272e-14m$  against direction of motion of electron

(from the interior of the Sun, to the Universe / wave =of electron neutrinos /

for  $v/c = 0,6$  .....electron

2. When electrons from the Universe have velocity  $v = 0,9953c$ , then

radius of force reach of electron  $r_e$ :

$r_e = 2,9852697367995728469528649797656e-21m$  in direction of motion of electron from the Universe, to the interior of the Sun,

$r_e = 5,8533905779558232539269262326763e-14m$  against direction of motion of electron (from the interior of the Sun, to the Universe / wave =of muon neutrinos /

for  $v/c = 0,9953$  ..... muon

3. When electrons from the Universe have velocity  $v = 0,99971c$ , then

radius of force reach of electron  $r_e = 2,840401487397554751560630135382e-24m$  in direction of motion from the Universe, to the interior of the Sun,

$r_e = 5,8375618415212342167582430481493e-14\text{m}$  against direction of motion of electron (from the interior of the Sun, to the Universe / wave =of tauon neutrinos /

for  $v/c=0,99971$  ..... tauon

### **Discussion**

The greater the velocity of the electrons, the smaller the radius of force reach of electron  $r_e$ ,

the easier and more likely it can penetrate in Sun or Earth.

Given the changing velocity of the electrons (the universe) we can simply explain "the neutrino oscillations".

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