What is an electron?

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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 .*

What is an electron?

An electron is a particle, that leaves a wave in the transmission medium.

Subject and Methods

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

$$T_{kin} = \frac{mc^2}{\cos^2 \vartheta}\left[\ln\left|1 - \frac{v}{c}\cos\vartheta\right| + \frac{\frac{v}{c}\cos\vartheta}{1 - \frac{v}{c}\cos\vartheta}\right] \tag{3.11}$$

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

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

$$T_{kin_0} = mc^2\left[\ln\left|1 - \frac{v}{c}\right| + \frac{\frac{v}{c}}{1 - \frac{v}{c}}\right] \tag{3.12}$$

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

$$T_{kin_{vd}} = mc^2 \left[\ln\left|1 + \frac{v}{c}\right| - \frac{\frac{v}{c}}{1 + \frac{v}{c}} \right] \qquad (3.13)$$

Modern physics knows very precise values of the kinetic energy of elementary particles.

Nonsymmetrical intensity form of moving charge leads to a precise relationship to calculate the kinetic energy of particles.

Electron moving in a transmission medium.

Kinetic energy of electron moving at the velocity of v has two different values:

1.Kinetic energy of electron $T_{kin_{vd}} = mc^2 \left[\ln\left|1 - \frac{v}{c}\right| + \frac{\frac{v}{c}}{1 - \frac{v}{c}} \right]$ in direction of motion - as particle.

It is realy Newton´s (correct) kinetic energy of electron. [Newton for v<<c $T_{kin_{vd}} = T_{kin_{wd}} = \frac{1}{2} m v^2$].

2. Kinetic energy $T_{kin_{wd}} = mc^2 \left[\ln\left|1 + \frac{v}{c}\right| - \frac{\frac{v}{c}}{1 + \frac{v}{c}} \right]$ against direction of motion of a particle – as wave.

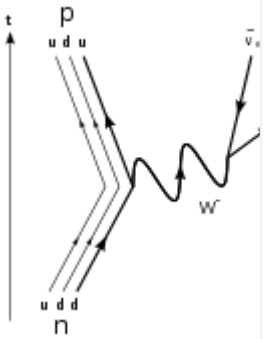
It is realy Maxwell´s electromagnetic wave energy in transmission medium.

Wave - particle duality elegantly incorporates kinetic energy in direction of movement (as particle in the direction of movement) and kinetic energy against directions of movement (as wave against the spread of direction of movement).

ELECTRON	Front of elektron	Behind elektron
$\frac{v}{c}$	$\left[ln\lvert 1-\frac{v}{c}\rvert+\frac{\frac{v}{c}}{1-\frac{v}{c}}\right]$ **kinetic energy of elektron in direction of motion of electron**	$\left[ln\lvert 1+\frac{v}{c}\rvert-\frac{\frac{v}{c}}{1+\frac{v}{c}}\right]$ **kinetic energy of elektron against direction of motion of electron**
0,0799086445 Kirchner for U_mov=1638,0 V	0,00356628385160740599059466482812711	0,00288070430067105631362487868874
0,082238621 Kirchner for U_mov =1735,96V	0,00378998886663387919657356552705 31	0,00304233231777031916908078 46773952
0,202205081 Perry,Chaffee for U_mov =10761,70903 V	0,02755125385653292262096002021821	0,01596227383294966542849887 3860349
0,269608445 Perry,Chaffee for U_mov =19623,64596 V	0,05495413305133968524372351 1450052	0,02635295616802296185241633 216709
0,682155567100627316 1671553 **Electron**	1,00000000000000000000000025402 94 **0,5109989099724959839612738895 6** MeV	0,1145513850359705191549799 1380189 **58,535632889220622949041233701 99 keV**
0,995308032046	206,76828223744685656745189 701043 **Muon 105,658366838 MeV = = kinetic energy of elektron in direction of motion of electron**	0,1919741907309480619762709 9443559 **Muon neutrino 98,0986022063665017156014631 16988 keV = kinetic energy of elektron against direction of motion of electron < 170 keV**
0,99971316674	3477,18894397593998486635 33204024 **Tauon 1776,84±0.17 MeV = kinetic energy of elektron in direction of motion of electron**	0,1930754722354370554950579271201 **Muon neutrino** 98,0988323306154745516047829 17292 **keV = kinetic energy of elektron against direction of motion of electron < 170 keV**
0,99999364465781184	157334,97358013414086695519 224486 **W+ BOSON** = 80 398±0.25 MeV	0,1931455917243982747650628 1953288 **Muon neutrino 98,6971868371602593582305116 06622 keV < 170 keV**
0,99999432258918	176123,54940648581389887129 681009	**0,1931457612072403132297472456 4287**
0,999994396590953	**178449,69572422000527027492336062 BOSÓN Z = 91 187,6 MeV = 91, 187,6 GeV**	**0,1931457797076835630825999925 3441 Muon neutrino 98,6972828964141347372324473125 7 keV < 170 keV**

Results

1. 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 :

β elektron	Front of β elektron	Behind β elektron	Decay modes
$\frac{v}{c}$	$\left[ln\lvert 1-\frac{v}{c}\rvert+\frac{\frac{v}{c}}{1-\frac{v}{c}}\right]$ **kinetic energy of elektron in direction of motion of electron**	$\left[ln\lvert 1+\frac{v}{c}\rvert-\frac{\frac{v}{c}}{1+\frac{v}{c}}\right]$ **kinetic energy of elektron against direction of motion of electron**	
0,99999364465781184	157334,97358013414086695519224486 **W+ BOSON =** 8398±0.25 MeV **= kinetic energy of β elektron in direction of motion of electron**	**0,193145591724398274765062819532 88 Muon neutrino < 170 keV = 0,17 MeV** **98,69718683716025935823051160662 2 keV = kinetic energy of β elektron against direction of motion of electron < 170 keV = 0,17 MeV**	 Feynman´s diagram **beta decay** of neutron
0,999994396591	178449,69572422000527027 **BOSON Z 91 187,6 MeV/c² 91, 187,6 GeV = kinetic energy of β elektron in direction of motion of electron**	0,193145779707683563082 **Muon neutrino =**98,6972828964141347372324 keV = **kinetic energy of β elektron against direction of motion of electron** < 170 keV = 0,17 MeV	

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