Physics is easy

Lubomir Vlcek

Rokytov 132, 086 01, Slovak Republic

Email: lubomir.vlcek@gmail.com

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 .*

Similarly hyperons, mesons and quarks can be replaced by proton and neutron (or alpha particle respectively) moving at different speeds from 0.1c up to 0.999.. c . While, the neutron is composed of proton and electron orbiting around it.

Thus, all particles, which are currently known, can be replaced by the various fast moving electron or proton (D,He ^{3} or alpha particle respectively).Electron and proton are the only stable fundamental elementary particles. Higgs Boson.

Keywords: mass, kinetic energy, potential energy. leptons. hyperons, mesons, quarks
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Introduction

Why are discovered by quarks in pairs?

u,d

c,s

t,b

We show that each particle is accompanied by his twin.

A pair of quarks of one generation = one speed of proton.

Subject and Methods

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

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

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

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

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

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

$$T_{\text{kin}_{\text{still}}} = mc^2\left[\ln\left|1 + \frac{v}{c}\right| - \frac{\frac{v}{c}}{1 + \frac{v}{c}}\right] \tag{3.13}$$

Comparing the kinetic energies of the baryon and proton we calculate the speed of proton:

2286,46 MeV**=**

$$\frac{mc^2}{\cos^2\vartheta}\left[ln|1 - \frac{v}{c}\cos\vartheta| + \frac{\frac{v}{c}cos\vartheta}{1 - \frac{v}{c}\cos\vartheta}\right] = eU_{\text{mov}} = eU_{\text{still}}\left(1 - \frac{v}{c}\cos\vartheta\right)^2 =$$

=938,272013096211620763557637264 57 MeV * **[ln |1-v/c|+ (v/c) / (1-v/c)]**

[ln |1-v/c|+ (v/c) / (1-v/c)] = 2,436883939930054640270555968 1979

v/c= 0,8022863362

Kinetic energy of proton in direction of motion of proton with speed 0,8022863362c =

= kinetic energy of Lambda hyperon = 2286,46 MeV

X = 938,272013096211620763557637264 57 MeV * 2,436883940296256952562771028967

X = 2286,460000343597380754904187289 7 MeV **(Λ Lambda + c = "unstable particle with** rest mass= 2286,46 MeV/c^{2} ").

v/c=0,8022863362 (1-v/c) = 0,1977136638

[ln |1-v/c|+ (v/c) / (1-v/c)] =2,436883940296256952562771028967

v/c=0,8022863365 (1-v/c) = 0,1977136635

[ln |1-v/c|+ (v/c) / (1-v/c)] =2,436883946453372206926479252 7779

Comparing the kinetic energies of the meson and proton we calculate the speed of proton:

134,97666 MeV**=**

$$\frac{mc^2}{\cos^2\vartheta}\left[ln|1-\frac{v}{c}\cos\vartheta|+\frac{\frac{v}{c}cos\vartheta}{1-\frac{v}{c}\cos\vartheta}\right]=eU_{\text{mov}}=eU_{\text{still}}\left(1-\frac{v}{c}\cos\vartheta\right)^2=$$

=938,272013096211620763557637264 57 MeV * **[ln |1+v/c|- (v/c) / (1+v/c)]**

v/c=**0,8022863362** (1+v/c) = **1,8022863362**

[ln |1+v/c|- (v/c) / (1+v/c)] =**0,14390683709177569312796570147315**

134,97666 /938,272 029 = 0,14385663840353062469903384490 64=[ln |1+v/c|- (v/c) / (1+v/c)]

X = **938,272 029** * 0,14390683709177569312796570147315=

=135,023760025072838804057735363 48 MeV **(π^0 = "unstable particle with rest mass= *134,*9766(6) MeV/c^{2} ").**

Against direction of movement of a proton traveling at a speed v = 0.8022863362 c arises at the moment (8.4×10^{-17} s) meson pion π^0

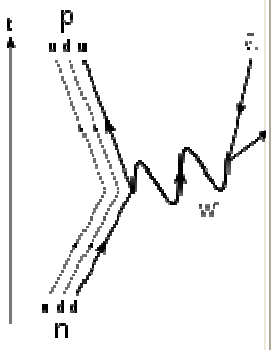
In direction of movement of a proton traveling at a speed v = 0.8022863362 c arises at the moment (2 x 10-13 s) charmed baryons Λ Lambda + c

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 :

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	0,00356628385160740599059464 82812711	0,00288070430067105631362487868874
0,082238621 Kirchner for U_mov =1735,96V	0,00378998886663387919657356 55270531	0,00304233231777031916908078467736952
0,202205081 Perry,Chaffee for U_mov =10761,70903 V	0,02755125385653292262096002 021821	0,01596227383294966542849887386034 9
0,269608445 Perry,Chaffee for U_mov =19623,64596 V	0,05495413305133968524372351 1450052	0,02635295616802296185241633216709
0,6821555671006273161 671553 **Electron**	1,00000000000000000000000025 40294 **0,5109989099724959839612738895 6** MeV	0,11455138503597051915497991380189 **58,535632889220622949041233701 99 keV**
0.9	6,69741490700595431598200854 53156	0,16816967564607898651735176667 7
0.99	94,39482981401190863196401709 0631	
0,9953098334237836613 341	206,84975630513419099721054873516	
0,995308032046	206,76828223744685656745189701043 **Muon 105,658366838 MeV = = kinetic energy of elektron in direction of motion of electron**	0,19197419073094806197627099443559 **Muon neutrino 98,0986022063665017156014631169988 keV = kinetic energy of elektron against direction of motion of electron < 170 keV**
0.999	992,09224472101786294794602563595	
0,99971316674	3477,18894397593998486635 33204024 **Tauon 1776,84±0.17 MeV = kinetic energy of elektron in direction of motion of electron**	0,19307547223543705549505792712 01 **Muon neutrino** 98,0988323306154745516047829172292 **keV = kinetic energy of elektron against direction of motion of electron < 170 keV**

0,9999	9989,78965962802381726392803 41813	0,1930996793224037036883154534 74951
0,99999	99987,4870745350297715799100 42727	0,1931446805599453302507217057 2902
0,999992	124987,263930983715561824143 74764	0,1931451805599453200839627884 3204
0,99999364465781184	157334,973580134140866955192 24486 **W+ BOSON =** 80 398±0.25 MeV	0,1931455917243982747650628195 3288 **Muon neutrino** **98,697186837160259358230511606622 keV < 170 keV**
0,99999432258918	176123,549406485813898871296 81009	**0,193145761207240313229747245642 87**
0,999994396590953	**178449,695724220005270274923360 62** **BOSÓN Z = 91 187,6 MeV = 91, 187,6 GeV**	**0,193145779707683563082599992534 41 Muon neutrino** **98,697282896414134737232447312 57 keV < 170 keV**

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**	
0,999993644657 81184	157334,973580134140866955 19224486 **W+ BOSON =** 8398±0.25 MeV **= kinetic energy of β elektron in direction of motion of electron**	**0,193145591724398274765062 81953288** **Muon neutrino < 170 keV = 0,17 MeV** **98,6971868371602593582305 11606622 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**B OSÓN 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	

2. Hyperons, mesons and quarks can be replaced by proton and neutron (or alpha particle respectively) moving at different speeds from 0.1c up to 0.999.. c . :

PROTON	**Front of proton**	**Behind proton**
$\frac{v}{c}$	$\left[ln\left\|1-\frac{v}{c}\right\|+\frac{\frac{v}{c}}{1-\frac{v}{c}}\right]$ **kinetic energy of proton in direction of motion of proton**	$\left[ln\left\|1+\frac{v}{c}\right\|-\frac{\frac{v}{c}}{1+\frac{v}{c}}\right]$ **kinetic energy of proton against direction of motion of proton**
0,7074479721087764	1,189082658682685020462562 44 **Lambda hyperón 1115,683 ± 0.006 MeV = kinetic energy of proton in direction of motion of proton = Lambda hyperón**	0,120669224591095911692388523961 22 **113,220558315613480988318115925MeV**
0,716976187625	1,271104736348611424094368008 **1192,642 MeV = kinetic energy of proton in direction of motion of proton = SIGMA nula**	0,122983972856336700566752308398 88 **115,392419806938709603502370404 17 MeV**
0,8022863362	**2,436883940296256952562771 Lambda hyperón 2286,46 MeV = kinetic energy of proton in direction of motion of proton = charmed Lambda**	**0,143906837091775693127965701473 15 135,023757736408955371203637944 6 MeV = kinetic energy of proton against direction of motion of proton = pion π^0: 134.9766(6) MeV**
0,8914255044669	5,989947394316358028703352934 ***5620,2 ± 1.6*** **MeV bottom Lambda Λ0b**	0,166032543584002546805655338341 **155,78368890804656430618186 MeV**
0,81056695762	2,615190441312234141034734660796 **Sigma ^0_c(2455)+ hyperon 2453,76 MeV**	0,145953215816287356894540342 96 **136,94381762181377198922812 MeV**
0,813524	2,683167656321633702604972666 **Sigma c (2520)+ hyperon 2517,5 MeV**	0,146684522552278926615805001825 **137,62998226518340186897401 43 MeV**
0,819183027	2,820184299506187549145805370506 6 **hyperon Chí 0 c (2645) 2646,1MeV**	0,148084815063558066905873956017 92 **138,94383753866483044589965432297 $\pi^{\pm}$: 139.57018(35) MeV**
0,81920429	2,820717194011214983397939795768 4	**0,148090078304527672456448068450 57**

	hyperon Chí c (2645)+ 2646,6MeV	**138,948775890364792702596955 MeV**
0,825051	2,9726987068450392321066778804343 **hyperon Chí 0 c (2790) 2791,9 MeV**	0,14953782531546511136343667740423 **140,30715639277108660929956 39 MeV**
0,825555765	2,9863408061737415489613191671364 **hyperon Sigma 0 c(2800)** 2802 **MeV**	0,14966286064342747247827858815071 **140,42447354164647621231116 94 MeV**
	hyperon Chí c(2815)+ 2816,5 **MeV**	
	Sigma c(2455)+ hyperon 2452,9 MeV	
0,81056695762	2,6151904413122341410347346607 96 **Sigma $^{0}_{c}$(2455)+ hyperon 2453,76 MeV**	0,14595321581628735689454034296 54 **136,943817621813771989228 12 MeV**
0,9928305	133,5433582767102921874750172 **Higgs Boson 125300 MeV/c^2**	**0,191354813279005033975005068774** **179,542872167240022072027 52**MeV/c^2

alpha particle	**Front of alpha particle**	**Behind alpha particle**	**Decay**
$\frac{v}{c}$	$\left[ln\lvert 1-\frac{v}{c}\rvert+\frac{\frac{v}{c}}{1-\frac{v}{c}}\right]$ **kinetic energy of alpha particle in direction of motion of alpha particle**	$\left[ln\lvert 1+\frac{v}{c}\rvert-\frac{\frac{v}{c}}{1+\frac{v}{c}}\right]$ **kinetic energy of alpha particle against direction of motion of alpha particle**	
0,6187	0,658438059111383627726 **2,45402 GeV**	0,099403057716843664575720 1911 370,51288079692915643521 MeV	
0,6821555671006273161671	1,000000000000000000000000 25 **3.727 379 109 93 GeV**	0,114551385035970519154979913 8019 **426,976439596624514721609 05 MeV**	**K^+ ,K^-** 493.7 MeV
0,74492	1,551644483964870224849 **5,7929 GeV**	0,129800885476868830167594034 5 **483,817108976897203793446 98 MeV**	**K^+ ,K^-** 493.7 MeV

0,7533	1,6539771829423002810159 **6,165** GeV	0,131852775030990039528128086 8 **491,46527923681218170305 MeV**	K^- 493.7 (Ω^- + J/ψ seen)

u,d quarks are in the proton at speed of proton :

from v= 0,05875c to v= 0,105065c .... down – up,

PROTON	Front of proton	Behind proton
$\frac{v}{c}$	$\left[ln\lvert 1-\frac{v}{c}\rvert+\frac{\frac{v}{c}}{1-\frac{v}{c}}\right]$ kinetic energy of proton in direction of motion of proton	$\left[ln\lvert 1+\frac{v}{c}\rvert-\frac{\frac{v}{c}}{1+\frac{v}{c}}\right]$ kinetic energy of proton against direction of motion of proton
0,05875	0,00187049880394503298617776261248 76 ***Down quark: 1,7550*** MeV	0,00159868351485434617944156923151 07 ***Up quark:*** 1,5 MeV
0,075	0,00311953961136922259672105451181 09 ***Down quark:*** 2,92697671 MeV	0,00255321971916100434131704830326 92 ***Up quark:*** 2,4MeV
0,081622	0,00373026153466014108536366154019 17 *Down quark:* 3,5 MeV	0,00299917404444244943223283169370 18 *Up quark:* 2,81404106871 MeV
0,08878	0,00445890135114829223121321088077 56 *Down quark:* 4,18366235 MeV	0,00351710373267956159477145230932 36 *Up quark:* 3,3 MeV
0,094686	0,00511569184940226624325622138376 19 *Down quark:* 4,8MeV	0,00397152784836062561964734521684 54 *Up quark:* 3,72637 MeV
0,105065	0,00639473405941738471776627692604 29 *Down quark:* 6 MeV	0,00482830150265965022910406572959 24 *Up quark:* 4,530260 MeV

c,s quarks are in the proton at speed of proton

from v=0,5111c to v=0,7805c :

PROTON	Front of proton	Behind proton
$\frac{v}{c}$	$\left[ln\lvert 1-\frac{v}{c}\rvert+\frac{\frac{v}{c}}{1-\frac{v}{c}}\right]$ **kinetic energy of proton in direction of motion of proton**	$\left[ln\lvert 1+\frac{v}{c}\rvert-\frac{\frac{v}{c}}{1+\frac{v}{c}}\right]$ **kinetic energy of proton against direction of motion of proton**
0,5111	0,32981074951021491557976368 70 **c quark: 309,452195927844585291MeV 1.16–1.34 GeV**	0,07460743427266448931608265 82 **s quark: 70,00206755693781114693070MeV/c^2**
0,6668	0,90218811150262740395503144 61 **c quark: 846,49785569 MeV 1.16–1.34 GeV**	0,11085762440585416420687015 65 **s quark: 104,0146** MeV
0,68215556	1,00000000000000000000000254 **proton 938,27201323 MeV**	0,11455138503597051915497991 38 **107,4803586559849549744 MeV/c^2 muon**
0,68235958	1,00137865656415237122738835717 32 **neutron = 939,5655681 MeV**	0,11460056876623030010684504 97 **107,52650637359396091907 6MeV muon**
0,713	1,23604749426877325552441352943 **c quark: 1160** MeV **1.16–1.34 GeV**	0,12201738104659464824870350 19 **s quark=114,485493763640 MeV**
0,72585	1,35355827716301434378382094041 84 **c quark: 1270** MeV **1.16–1.34 GeV**	0,12514431408438967945446850 49 **s quark: 117,41941 MeV**
0,73333	1,42815727326988258696780184 68 **c quark: 1340** MeV **1.16–1.34 GeV**	0,12696860023316592749751861 91 **s quark= 119,1311MeV**
0,7805	2,03940560956953545777029721 59 **c quark:1913,517207083363387638** MeV/c^2 **1.16–1.34 GeV**	0,13853421250289559168530489 70 **s quark: 129,982774** MeV

t quark is in the proton (neutron) at speed of proton (neutron):
v=0,994637c for *Top quark:* 169 100MeV

v=0,994766c for *Top quark:* 173 400MeV/c^2

PROTON	Front of proton	Behind proton
$\frac{v}{c}$	$\left[ln\lvert 1-\frac{v}{c}\rvert+\frac{\frac{v}{c}}{1-\frac{v}{c}}\right]$ **kinetic energy of proton in direction of motion of proton**	$\left[ln\lvert 1+\frac{v}{c}\rvert-\frac{\frac{v}{c}}{1+\frac{v}{c}}\right]$ **kinetic energy of proton against direction of motion of proton**
0,994637	180,22492157457995929571290 46 ***Top quark:* 169 100MeV**	0,191806433786441122906010295 93 **179,9666087792708042658841 MeV**
0,994766	184,80781431716241834344540 31 ***Top quark:* 173 400MeV**	0,191838683558878222897300444041 **179,9968678381815771389178 MeV**

b quark is in the proton (neutron) at speed of proton (neutron):

v=0,8665c pre 4,2 GeV *Bottom quark*

PROTON	Front of proton	Behind proton
$\frac{v}{c}$	$\left[ln\lvert 1-\frac{v}{c}\rvert+\frac{\frac{v}{c}}{1-\frac{v}{c}}\right]$ **kinetic energy of proton in direction of motion of proton**	$\left[ln\lvert 1+\frac{v}{c}\rvert-\frac{\frac{v}{c}}{1+\frac{v}{c}}\right]$ **kinetic energy of proton against direction of motion of proton**
0,8665	4,476313841592169302436394 4,2 GeV ***Bottom quark***	0,159827140990503087217669575 **149,96133334595438795425311140944 MeV**

Discussion

1. Mass / kg / never was, is not or will not be energy / Joule = Nm = kg m ^ 2 s ^ -2 /.

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

v/c	Vlcek ´s theory T_{kin}	Einstein ´s theory T_{kin}
0.1	0.0050mc2	0.0050moc2
0.2	0.0212mc2	0.0200moc2
0.3	0.0517mc2	0.0480moc2
0.4	0.1033mc2	0.0910moc2
0.5	0.1895mc2	0.1550moc2
0.6	0.3393mc2	0.2500moc2
0.7	0.6233mc2	0.4010moc2
0.8	1.2669mc2	0.6670moc2
0.9	3.4327mc2	1.2930moc2
0.99	47.294mc2	6.9200moc2
1.0	infinite	infinite

Direct measurement of speed in the experiments Kirchner, Perry, Chaffee for v/c = 0.08 - 0.27 can not yet prove that the theory is correct.

3.Comparison Vlcek – SLAK

SLAK: Quarks are fundamental matter particles that are constituents of neutrons and protons and other hadrons. There are six different types of quarks. Each quark type is called a flavor.

Flavor		**Mass (GeV/c^2)**	**Electric Charge (e)**
u	up	0.004	+2/3
d	down	0.008	-1/3
c	charm	1.5	+2/3
s	strange	0.15	-1/3
t	top	176	+2/3
b	bottom	4.7	-1/3

Vlcek: Thus, all particles, which are currently known, can be replaced by the various fast moving electron or proton (or alpha particle respectively).

Electron and proton are the stable fundamental elementary particles.

t -> b -> c -> s -> u <-> d

This decay of quarks actually means a reduction of the speed of proton.

QUARKS = proton of different speeds

A pair of quarks of one generation = one speed of proton:

u,d quarks are in the proton at speed of proton :

from v= 0,05875c to v= 0,105065c .... down – up,

c,s quarks are in the proton at speed of proton

from v=0,5111c to v=0,7805c :

t quark is in the proton (neutron) at speed of proton (neutron):
v=0,994637c for *Top quark:* 169 100MeV

v=0,994766c for *Top quark:* 173 400MeV/c^2

b quark is in the proton (neutron) at speed of proton (neutron):

v=0,8665c pre 4,2 GeV *Bottom quark*

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 0.001c up to 0.999.. c :

Electron, electron neutrino are in the electron at speed of electron :

from v= 0.001c to v= 0.9 c

Muon, muon neutrino are in the electron at speed of electron :

v= 0,995308032046c

Tauon, tauon neutrino are in the electron at speed of electron : v= 0,99971316674c

W + - boson and neutrino are in the β electron at speed of electron :

v= 0,99999364465781184c

Z boson and neutrino are in the β electron at speed of electron : v= 0,999994396590953c

Higgs Boson 125300 MeV/c^2 speed of proton : v= 0,9928305c

β electron is radiated from a neutron

Hyperons, mesons and quarks can be replaced by proton and neutron ,or alpha particle respectively, moving at different speeds from 0.1c up to 0.999.. c:

Lambda hyperón 2286,46 MeV and pion π^0: 134.9766(6) MeV are in the proton at speed of proton v= 0,8022863362c

hyperon Chí c (2645)+ 2646,6MeV and pion $\pi^{\pm}$: 139.57018(35) MeV are in the proton at speed of proton v= 0,819183027c

hyperon 6,165 GeV and meson K^{-} 493.7 MeV are in the alpha particle at speed of alpha particle v= 0,7533c

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