

Physics is easy

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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 $0.999.. c$.*

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:

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

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

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

$$T_{kin_{\vartheta=0}} = mc^2 \left[\ln \left| 1 - \frac{v}{c} \right| + \frac{\frac{v}{c}}{1 - \frac{v}{c}} \right] \quad (3.12)$$

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

$$T_{kin_{\vartheta=180}} = mc^2 \left[\ln \left| 1 + \frac{v}{c} \right| - \frac{\frac{v}{c}}{1 + \frac{v}{c}} \right] \quad (3.13)$$

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

2286,46 MeV=

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

$$= 938,27201309621162076355763726457 \text{ MeV} * [\ln |1-v/c| + (v/c) / (1-v/c)]$$

$$[\ln |1-v/c| + (v/c) / (1-v/c)] = 2,4368839399300546402705559681979$$

$$v/c = 0,8022863362$$

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

$$= \text{kinetic energy of Lambda hyperon} = 2286,46 \text{ MeV}$$

$$X = 938,27201309621162076355763726457 \text{ MeV} * 2,436883940296256952562771028967$$

$X = 2286,4600003435973807549041872897 \text{ MeV}$ (Λ Lambda + c = “unstable particle with rest mass= $2286,46 \text{ MeV}/c^2$ ”).

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

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

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

$$[\ln |1-v/c| + (v/c) / (1-v/c)] = 2,4368839464533722069264792527779$$

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

$$134,97666 \text{ MeV} =$$

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

$$= 938,27201309621162076355763726457 \text{ MeV} * [\ln |1+v/c| - (v/c) / (1+v/c)]$$

$$v/c=0,8022863362 \quad (1+v/c) = 1,8022863362$$

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

$$134,97666 / 938,272029 = 0,1438566384035306246990338449064 = [\ln |1+v/c| - (v/c) / (1+v/c)]$$

$$X = 938,272029 * 0,14390683709177569312796570147315 =$$

$$= 135,02376002507283880405773536348 \text{ MeV}$$
 (π^0 = “unstable particle with rest mass= $134,9766(6) \text{ MeV}/c^2$ ”).

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

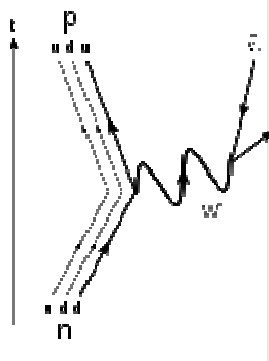
In direction of movement of a proton traveling at a speed $v = 0.8022863362 c$ arises at the moment (2×10^{-13} s) charmed baryons Λ Lambda + c

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
$\frac{v}{c}$	$\left[\ln \left 1 - \frac{v}{c} \right + \frac{\frac{v}{c}}{1 - \frac{v}{c}} \right]$	$\left[\ln \left 1 + \frac{v}{c} \right - \frac{\frac{v}{c}}{1 + \frac{v}{c}} \right]$
	kinetic energy of elektron in direction of motion of electron	kinetic energy of elektron against direction of motion of electron
0,0799086445 Kirchner for U_mov=1638,0 V	0,00356628385160740599059464 82812711	0,002880704300671056313624878 68874
0,082238621 Kirchner for U_mov =1735,96V	0,00378998886663387919657356 55270531	0,003042332317770319169080784 6773952
0,202205081 Perry,Chaffee for U_mov =10761,70903 V	0,02755125385653292262096002 021821	0,015962273832949665428498873 860349
0,269608445 Perry,Chaffee for U_mov =19623,64596 V	0,05495413305133968524372351 1450052	0,026352956168022961852416332 16709
0,6821555671006273161 671553 Electron	1,000000000000000000000000025 40294 0,51099890997249598396127388956 MeV	0,114551385035970519154979 91380189 58,53563288922062294904123370199 keV
0.9	6,69741490700595431598200854 53156	0,168169675646078986517351766 677
0.99	94,3948298140119086319640170 90631	
0,9953098334237836613 341	206,849756305134190997210548 73516	
0,995308032046	206,768282237446856567451897 01043 Muon 105,658366838 MeV = = kinetic energy of elektron in direction of motion of electron	0,191974190730948061976270994 43559 Muon neutrino 98,09860220636650171560146311 6988 keV = kinetic energy of elektron against direction of motion of electron < 170 keV
0.999	992,092244721017862947946025 63595	
0,99971316674	3477,18894397593998486635 33204024 Tauon 1776,84±0.17 MeV = kinetic energy of elektron in direction of motion of electron	0,193075472235437055495057 9271201 Muon neutrino 98,09883233061547455160478291 7292 keV = kinetic energy of elektron against direction of motion of electron < 170 keV

0,9999	9989,78965962802381726392803 41813	0,193099679322403703688315453 74951
0,99999	99987,4870745350297715799100 42727	0,193144680559945330250721705 72902
0,999992	124987,263930983715561824143 74764	0,193145180559945320083962788 43204
0,99999364465781184	157334,973580134140866955192 24486 W+ BOSON = 80 398±0.25 MeV	0,193145591724398274765062819 53288 Muon neutrino 98,69718683716025935823051160 6622 keV < 170 keV
0,99999432258918	176123,549406485813898871296 81009	0,193145761207240313229747245642 87
0,999994396590953	178449,69572422000527027492336062 BOSÓN Z = 91 187,6 MeV = 91, 187,6 GeV	0,193145779707683563082599992534 41 Muon neutrino 98,69728289641413473723244731257 keV < 170 keV

β elektron	Front of β elektron	Behind β elektron	Decay modes
$\frac{v}{c}$	$\left[\ln \left 1 - \frac{v}{c} \right + \frac{\frac{v}{c}}{1 - \frac{v}{c}} \right]$ kinetic energy of elektron in direction of motion of electron	$\left[\ln \left 1 + \frac{v}{c} \right - \frac{\frac{v}{c}}{1 + \frac{v}{c}} \right]$ 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	0,19314559172439827476506281953288 Muon neutrino < 170 keV = 0,17 MeV 98,697186837160259358230511606622 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	178449,69572422000527027B OSÓN Z 91 187,6 MeV/c ² 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
$\frac{v}{c}$	$\left[\ln \left 1 - \frac{v}{c} \right + \frac{\frac{v}{c}}{1 - \frac{v}{c}} \right]$ <p>kinetic energy of proton in direction of motion of proton</p>	$\left[\ln \left 1 + \frac{v}{c} \right - \frac{\frac{v}{c}}{1 + \frac{v}{c}} \right]$ <p>kinetic energy of proton against direction of motion of proton</p>
0,7074479721087764	1,18908265868268502046256244 Lambda hyperón 1115,683 ± 0.006 MeV = kinetic energy of proton in direction of motion of proton = Lambda hyperón	0,12066922459109591169238852396122 113,220558315613480988318115925MeV
0,716976187625	1,271104736348611424094368008 1192,642 MeV = kinetic energy of proton in direction of motion of proton = SIGMA nula	0,12298397285633670056675230839888 115,39241980693870960350237040417 MeV
0,8022863362	2,436883940296256952562771 Lambda hyperón 2286,46 MeV = kinetic energy of proton in direction of motion of proton = charmed Lambda	0,14390683709177569312796570147315 135,0237577364089553712036379446 MeV = kinetic energy of proton against direction of motion of proton = pion π⁰: 134.9766(6) MeV
0,8914255044669	5,989947394316358028703352934 5620,2 ± 1.6 MeV bottom Lambda Λ_{0b}	0,166032543584002546805655338341 155,78368890804656430618186 MeV
0,81056695762	2,615190441312234141034734660796 Sigma⁰_c(2455)+ hyperon 2453,76 MeV	0,14595321581628735689454034296 136,94381762181377198922812 MeV
0,813524	2,683167656321633702604972666 Sigma^c(2520)+ hyperon 2517,5 MeV	0,146684522552278926615805001825 137,6299822651834018689740143 MeV
0,819183027	2,8201842995061875491458053705066 hyperon Chí 0 c (2645) 2646,1MeV	0,14808481506355806690587395601792 138,94383753866483044589965432297 π[±]: 139.57018(35) MeV
0,81920429	2,8207171940112149833979397957684	0,14809007830452767245644806845057

	hyperon $\chi_c(2645)^+$ 2646,6MeV	138,948775890364792702596955 MeV
0,825051	2,9726987068450392321066778804343 hyperon $\chi_c(2790)$ 2791,9 MeV	0,14953782531546511136343667740423 140,3071563927710866092995639 MeV
0,825555765	2,9863408061737415489613191671364 hyperon $\Sigma_c(2800)$ 2802 MeV	0,14966286064342747247827858815071 140,4244735416464762123111694 MeV
	hyperon $\chi_c(2815)^+$ 2816,5 MeV	
	$\Sigma_c(2455)^+$ hyperon 2452,9 MeV	
0,81056695762	2,615190441312234141034734660796 $\Sigma_c^0(2455)^+$ hyperon 2453,76 MeV	0,1459532158162873568945403429654 136,94381762181377198922812 MeV
0,9928305	133,5433582767102921874750172 Higgs Boson 125300 MeV/c ²	0,191354813279005033975005068774 179,54287216724002207202752MeV/c ²

alpha particle	Front of alpha particle	Behind alpha particle	Decay
$\frac{v}{c}$	$\left[\ln \left 1 - \frac{v}{c} \right + \frac{\frac{v}{c}}{1 - \frac{v}{c}} \right]$ kinetic energy of alpha particle in direction of motion of alpha particle	$\left[\ln \left 1 + \frac{v}{c} \right - \frac{\frac{v}{c}}{1 + \frac{v}{c}} \right]$ kinetic energy of alpha particle against direction of motion of alpha particle	
0,6187	0,658438059111383627726 2,45402 GeV	0,0994030577168436645757201911 370,51288079692915643521 MeV	
0,6821555671006273161671	1,0000000000000000000000025 3.727 379 109 93 GeV	0,1145513850359705191549799138019 426,97643959662451472160905 MeV	K⁺, K⁻ 493.7 MeV
0,74492	1,551644483964870224849 5,7929 GeV	0,1298008854768688301675940345 483,81710897689720379344698 MeV	K⁺, K⁻ 493.7 MeV

0,7533	1,6539771829423002810159 6,165 GeV	0,1318527750309900395281280868 491,46527923681218170305 MeV	K ⁻ 493.7 (Ω^- + J/ ψ seen)
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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
$\frac{v}{c}$	$\left[\ln \left 1 - \frac{v}{c} \right + \frac{\frac{v}{c}}{1 - \frac{v}{c}} \right]$ 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
0,05875	0,0018704988039450329861777626124876 <i>Down quark: 1,7550 MeV</i>	0,0015986835148543461794415692315107 <i>Up quark: 1,5 MeV</i>
0,075	0,0031195396113692225967210545118109 <i>Down quark: 2,92697671 MeV</i>	0,0025532197191610043413170483032692 <i>Up quark: 2,4MeV</i>
0,081622	0,0037302615346601410853636615401917 <i>Down quark: 3,5 MeV</i>	0,0029991740444424494322328316937018 <i>Up quark: 2,81404106871 MeV</i>
0,08878	0,0044589013511482922312132108807756 <i>Down quark: 4,18366235 MeV</i>	0,0035171037326795615947714523093236 <i>Up quark: 3,3 MeV</i>
0,094686	0,0051156918494022662432562213837619 <i>Down quark: 4,8MeV</i>	0,0039715278483606256196473452168454 <i>Up quark: 3,72637 MeV</i>
0,105065	0,0063947340594173847177662769260429 <i>Down quark: 6 MeV</i>	0,0048283015026596502291040657295924 <i>Up quark: 4,530260 MeV</i>

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
$\frac{v}{c}$	$\left[\ln \left 1 - \frac{v}{c} \right + \frac{\frac{v}{c}}{1 - \frac{v}{c}} \right]$ <p>kinetic energy of proton in direction of motion of proton</p>	$\left[\ln \left 1 + \frac{v}{c} \right - \frac{\frac{v}{c}}{1 + \frac{v}{c}} \right]$ <p>kinetic energy of proton against direction of motion of proton</p>
0,5111	0,3298107495102149155797636870 c quark: 309,452195927844585291 MeV 1.16–1.34 GeV	0,0746074342726644893160826582 s quark: 70,00206755693781114693070 MeV/c²
0,6668	0,90218811115026274039550314461 c quark: 846,49785569 MeV 1.16–1.34 GeV	0,1108576244058541642068701565 s quark: 104,0146 MeV
0,68215556	1,0000000000000000000000000254 proton 938,27201323 MeV	0,1145513850359705191549799138 107,4803586559849549744 MeV/c² muon
0,68235958	1,0013786565641523712273883571732 neutron = 939,5655681 MeV	0,1146005687662303001068450497 107,526506373593960919076 MeV muon
0,713	1,23604749426877325552441352943 c quark: 1160 MeV 1.16–1.34 GeV	0,1220173810465946482487035019 s quark= 114,485493763640 MeV
0,72585	1,3535582771630143437838209404184 c quark: 1270 MeV 1.16–1.34 GeV	0,1251443140843896794544685049 s quark: 117,41941 MeV
0,73333	1,4281572732698825869678018468 c quark: 1340 MeV 1.16–1.34 GeV	0,1269686002331659274975186191 s quark= 119,1311 MeV
0,7805	2,0394056095695354577702972159 c quark: 1913,517207083363387638 MeV/c² 1.16–1.34 GeV	0,1385342125028955916853048970 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/c²

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
0,994637	180,2249215745799592957129046 Top quark: 169 100MeV	0,19180643378644112290601029593 179,9666087792708042658841 MeV
0,994766	184,8078143171624183434454031 Top quark: 173 400MeV	0,19183868355887822897300444041 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
$\frac{v}{c}$	$\left[\ln \left 1 - \frac{v}{c} \right + \frac{\frac{v}{c}}{1 - \frac{v}{c}} \right]$ 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
0,8665	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	0.0050mc ²	0.0050moc ²
0.2	0.0212mc ²	0.0200moc ²
0.3	0.0517mc ²	0.0480moc ²
0.4	0.1033mc ²	0.0910moc ²
0.5	0.1895mc ²	0.1550moc ²
0.6	0.3393mc ²	0.2500moc ²
0.7	0.6233mc ²	0.4010moc ²
0.8	1.2669mc ²	0.6670moc ²
0.9	3.4327mc ²	1.2930moc ²
0.99	47.294mc ²	6.9200moc ²
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.

$$t \rightarrow b \rightarrow c \rightarrow s \rightarrow u \leftrightarrow d$$

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/c²

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 $v=0.9c$

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/c² 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 Σ^+ (2645) \pm 2646,6 MeV and pion π^+ : 139.57018(35) MeV are in the proton at speed of proton $v = 0,819183027c$

hyperon Σ^- 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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