

http://www.if.pw.edu.pl/~wosinska/372,20,hiperon_omega

$$\begin{array}{ccccc}
 & |K^0\rangle = |d\bar{s}\rangle & & |K^+\rangle = |u\bar{s}\rangle & \\
 |\pi^-\rangle = |\bar{u}d\rangle & & \pi^0, \eta_8 & & |\pi^+\rangle = |u\bar{d}\rangle \\
 & |K^-\rangle = |\bar{u}s\rangle & & |\bar{K}^0\rangle = |\bar{d}s\rangle &
 \end{array}$$

czyli

$$|\pi^0\rangle = \frac{1}{\sqrt{2}}(u\bar{u} - d\bar{d}), \dots, |\eta_8\rangle = \frac{1}{\sqrt{6}}(u\bar{u} + d\bar{d} - 2s\bar{s})$$

liczby kwantowe zapachowe będą odpowiednio S, I_3

$$\begin{array}{ccc}
 +1, -\frac{1}{2} & +1, +\frac{1}{2} & \\
 0, -1 & 0, 0 & 0, +1 \\
 -1, -\frac{1}{2} & -1, +\frac{1}{2} &
 \end{array}$$

raz singlet zwany η_1 o liczbach zapachu 0,0:

$$|\eta_1\rangle = \frac{1}{\sqrt{3}}(u\bar{u} + d\bar{d} + s\bar{s})$$

$$\pi^0 = \frac{1}{\sqrt{2}}(u\bar{u} - d\bar{d})$$

$$\eta^0 = \frac{1}{\sqrt{6}}(u\bar{u} + d\bar{d} - 2s\bar{s})$$

$$\eta'^0 = \frac{1}{\sqrt{3}}(u\bar{u} + d\bar{d} + s\bar{s})$$

Mesons

Particle	Symbol	Anti-particle	Makeup	Rest mass MeV/c ²	S	C	B	Lifetime	Decay Modes
Pion	π^+	π^-	$u\bar{d}$	139.6	0	0	0	2.60×10^{-8}	$\mu^+ \nu_\mu$
Pion	π^0	Self	$\frac{\bar{u}u + \bar{d}d}{\sqrt{2}}$	135.0	0	0	0	0.83×10^{-16}	2γ
Kaon	K^+	K^-	$u\bar{s}$	493.7	+1	0	0	1.24×10^{-8}	$\mu^+ \nu_\mu, \pi^+ \pi^0$
Kaon	K_S^0	K_S^0	1*	497.7	+1	0	0	0.89×10^{-10}	$\pi^+ \pi^-, 2\pi^0$
Kaon	K_L^0	K_L^0	1*	497.7	+1	0	0	5.2×10^{-8}	$\pi^+ e^- \bar{\nu}_e$
Eta	η^0	Self	2*	548.8	0	0	0	$< 10^{-18}$	$2\gamma, 3\mu$
Eta prime	η'^0	Self	2*	958	0	0	0
Rho	ρ^+	ρ^-	$u\bar{d}$	770	0	0	0	0.4×10^{-23}	π, π
Rho	ρ^0	Self	$u\bar{u}, \bar{d}d$	770	0	0	0
Omega	ω^0	Self	$u\bar{u}, \bar{d}d$	782	0	0	0
Phi	ϕ	Self	$s\bar{s}$	1020	0	0	0	20×10^{-23}	$K^+ K^-, K^0 \bar{K}^0$
D	D^+	D^-	$c\bar{d}$	1869.4	0	+1	0	10.6×10^{-13}	$K^+ \pi^-, e^+ \pi^-$
D	D^0	\bar{D}^0	$c\bar{u}$	1864.6	0	+1	0	4.2×10^{-13}	$[K, \mu, e]^+ \pi^-$
D	D_S^+	D_S^-	$c\bar{s}$	1969	+1	+1	0	4.7×10^{-13}	$K^+ \pi^-$
J/Psi	J/ψ	Self	$c\bar{c}$	3096.9	0	0	0	0.8×10^{-20}	$e^+ e^-, \mu^+ \mu^-, \dots$
B	B^-	B^+	$b\bar{u}$	5279	0	0	-1	1.5×10^{-12}	$D^0 \pi^+$
B	B^0	\bar{B}^0	$b\bar{d}$	5279	0	0	-1	1.5×10^{-12}	$D^0 \pi^+$
B_s	B_s^0	\bar{B}_s^0	$b\bar{s}$	5375	0	0	-1
Upsilon	Y	Self	$b\bar{b}$	9460.4	0	0	0	1.3×10^{-20}	$e^+ e^-, \mu^+ \mu^-, \dots$

2* $\rightarrow (u\bar{u} + \bar{d}d - 2s\bar{s})/\sqrt{6}$

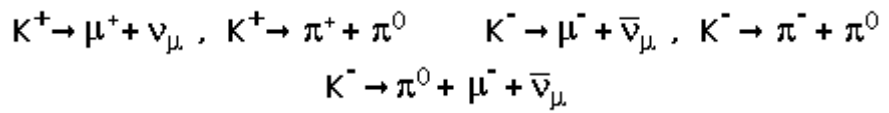
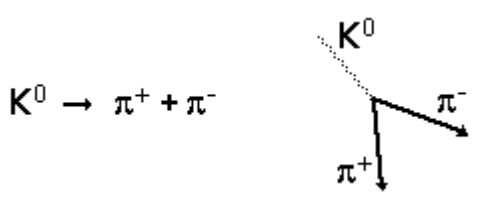
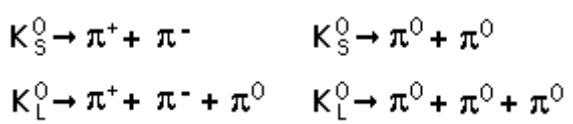
Kaon	K^+	K^-	$u\bar{s}$	493.7	+1	0	0	1.24×10^{-8}	$\mu^+ \nu_\mu, \pi^+ \pi^0$
Kaon	K_S^0	K_S^0	1*	497.7	+1	0	0	0.89×10^{-10}	$\pi^+ \pi^-, 2\pi^0$
Kaon	K_L^0	K_L^0	1*	497.7	+1	0	0	5.2×10^{-8}	$\pi^+ e^- \bar{\nu}_e$

1* The neutral [Kaons](#) K_S^0 and K_L^0 represent symmetric and antisymmetric mixtures

One is called K-zero-short $K_S^0 = \frac{\Psi(d\bar{s}) + \Psi(\bar{d}s)}{\sqrt{2}}$ Lifetime 9×10^{-11} s

The other is called K-zero-long. $K_L^0 = \frac{\Psi(d\bar{s}) - \Psi(\bar{d}s)}{\sqrt{2}}$ Lifetime 5×10^{-8} s

These two particles are considered to be combinations of down-antistrange and antidown-strange quarks. These particles decay into pions by



http://home.nycap.rr.com/leptonjim/physics/1_model/after.html model mezonů z kvarků

Commonly Stated Reaction	Proposed Reaction Statement	Balanced (qmsc) Description
$K^- \rightarrow \mu^- \nu_\mu$	$K^- \rightarrow \mu^- \nu_\mu (\nu_\mu \nu_e)$	$(-1010) \rightarrow (-1110) + (00-10) + (0010) + (0-100)$
$K^- \rightarrow \mu^- \pi^0 \nu_\mu$	$K^- \rightarrow \mu^- \pi^0 \nu_\mu (\nu_\mu \nu_e)$	$(-1010) \rightarrow (-1110) + (0000) + (00-10) + (0010) + (0-100)$
$K^- \rightarrow e^- \pi^0 \nu_e$	$K^- \rightarrow e^- \pi^0 \nu_e (\nu_\mu \nu_e)$	$(-1010) \rightarrow (-1000) + (0000) + (0100) + (0-100) + (0010)$
$K^- \rightarrow \pi^- \pi^0$	$K^- \rightarrow \pi^- \pi^0 (\nu_\mu \nu_e)$	$(-1010) \rightarrow (-1100) + (0000) + (0010) + (0-100)$
$K^- \rightarrow \pi^- \pi^+ \pi^-$	$K^- \rightarrow \pi^- \pi^+ \pi^- (\nu_\mu \nu_e)$	$(-1010) \rightarrow (-1100) + (1-100) + (-1100) + (0010) + (0-100)$
$K^0 \rightarrow \pi^- \pi^+ \pi^0$	$K^0 \rightarrow \pi^- \pi^+ \pi^0 (\nu_\mu \nu_e)$	$(0-110) \rightarrow (1-100) + (-1100) + (0000) + (0010) + (0-100)$
$K^0 \rightarrow \pi^+ e^- \nu_e$	$K^0 \rightarrow \pi^+ e^- \nu_e (\nu_\mu \nu_e)$	$(0-110) \rightarrow (1-100) + (-1000) + (0100) + (0-100) + (0010)$
$K^0 \rightarrow \pi^- \pi^+$	$K^0 \rightarrow \pi^- \pi^+ (\nu_\mu \nu_e)$	$(0-110) \rightarrow (1-100) + (-1100) + (0010) + (0-100)$

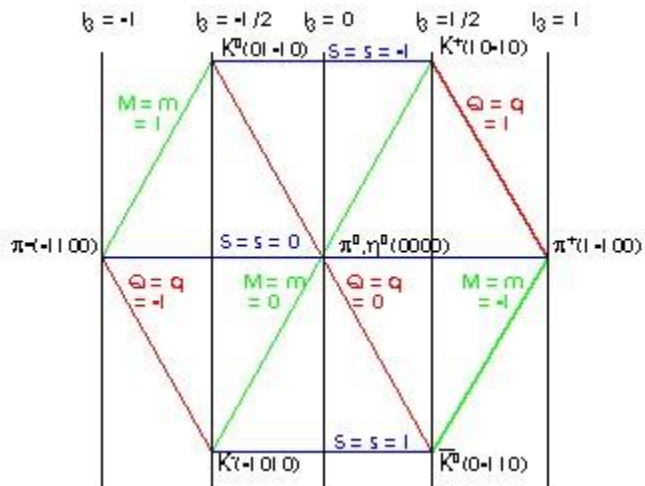
Particle	Lepton Excess/Charge	Isospin	Uph-	Down-	Anti-	Charm
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	e^+	ν_e	ν_μ	ν_τ	I_3	ish-ness	ish-ness	strange-ness	C
	q	m	s	c		U	D	S	
μ^-	-1	1	1	0	-1	-3	-1	0	1
τ^-	-1	1	0	1	-1	-2	0	-1	0
τ^+	1	-1	0	-1	1	2	0	1	0
μ^+	1	-1	-1	0	1	3	1	0	-1

Particle	Lepton Excess/Charge				Isospin I_3	Uph- ish- ness U	Down- ish- ness D	Anti- strange -ness S	Charm C
	e^+	ν_e	ν_μ	ν_τ					
	q	m	s	c					
e^+	1	0	0	0	+1/2	-1	-2	-1	1
ν_e	0	1	0	0	-1/2	-2	-1	-1	1
ν_μ	0	0	1	0	0	-2	-2	0	1
ν_τ	0	0	0	1	0	-1	-1	-1	0
ν_τ	0	0	0	-1	0	1	1	1	0
ν_μ	0	0	-1	0	0	2	2	0	-1
ν_e	0	-1	0	0	+1/2	2	1	1	-1
e^-	-1	0	0	0	-1/2	1	2	1	-1

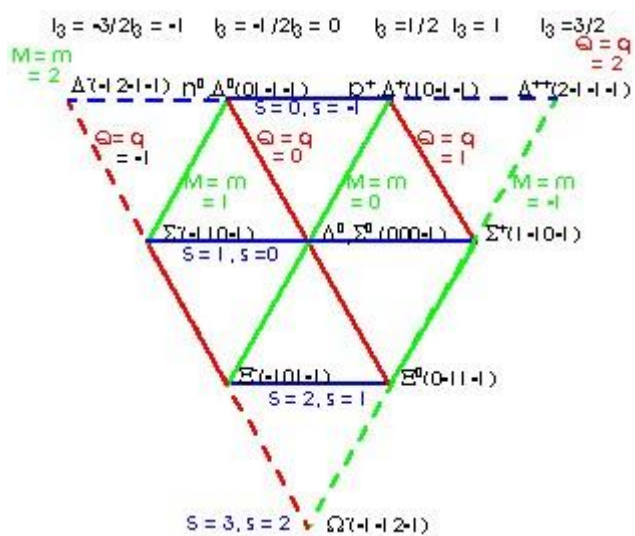
Particle	Lepton Excess/Charge				Isospin	Uph- ish- ness	Down- ish- ness	Anti- strange -ness	Charm
	e^+	ν_e	ν_μ	ν_τ					

	q	m	s	c	I ₃	U	D	S	C
π^-	-1	1	0	0	-1	-1	1	0	0
K^-	-1	0	1	0	-1/2	-1	0	1	0
K^0	0	-1	1	0	1/2	0	-1	1	0
π^0	0	0	0	0	0	0	0	0	0
η^0	0	0	0	0	0	0	0	0	0
K^0	0	1	-1	0	-1/2	0	1	-1	0
K^+	1	0	-1	0	1/2	1	0	-1	0
π^+	1	-1	0	0	1	1	-1	0	0



Particle	Lepton Excess/Charge				Isospin	Up-ish-ness	Down-ish-ness	Anti-strange-ness	Charm
	e^+	ν_e	ν_μ	ν_τ					
	q	m	s	c	I ₃	U	D	S	C
n^0	0	1	-1	-1	-1/2	1	2	0	0
p^+	1	0	-1	-1	+1/2	2	1	0	0

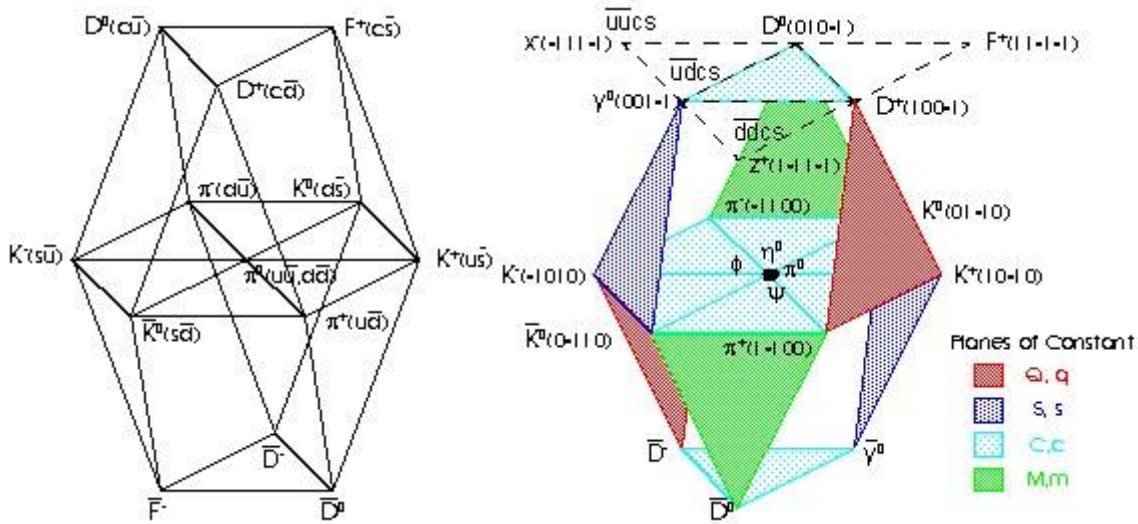
Λ^0	0	0	0	-1	0	1	1	1	0
Δ^-	-1	2	-1	-1	-3/2	0	3	0	0
Δ^0	0	1	-1	-1	-1/2	1	2	0	0
Δ^+	1	0	-1	-1	+1/2	2	1	0	0
Δ^{++}	2	-1	-1	-1	+3/2	3	0	0	0
Σ^-	-1	1	0	-1	-1	0	2	1	0
Σ^0	0	0	0	-1	0	1	1	1	0
Σ^+	1	-1	0	-1	1	2	0	1	0
Ξ^-	-1	0	1	-1	-1/2	0	1	2	0
Ξ^0	0	-1	1	-1	+1/2	1	0	2	0
Ω^-	-1	1	2	-1	0	0	0	3	0



Commonly Stated Reaction	Proposed Reaction Statement	Balanced (qmsc) Description

$n^0 \rightarrow p^+ e^- \bar{\nu}_e$	$n^0 \rightarrow p^+ e^- \nu_e$	$(01-1-1) \rightarrow (10-1-1) + (-1000) + (0100)$
$\Lambda^0 \rightarrow p^+ \pi^-$	$\Lambda^0 \rightarrow p^+ \pi^- (\nu_\mu \nu_e)$	$(000-1) \rightarrow (10-1-1) + (-1100) + (0-100) + (0010)$
$\Lambda^0 \rightarrow n^0 \pi^0$	$\Lambda^0 \rightarrow n^0 \pi^0 (\nu_\mu \nu_e)$	$(000-1) \rightarrow (01-1-1) + (0000) + (0-100) + (0010)$
$\Sigma^0 \rightarrow \Lambda^0 \gamma$	$\Sigma^0 \rightarrow \Lambda^0 \gamma$	$(000-1) \rightarrow (000-1) + (0000)$
$\Sigma^+ \rightarrow p^+ \pi^0$	$\Sigma^+ \rightarrow p^+ \pi^0 (\nu_\mu \nu_e)$	$(1-10-1) \rightarrow (10-1-1) + (0000) + (0-100) + (0010)$
$\Sigma^+ \rightarrow n^0 \pi^+$	$\Sigma^+ \rightarrow n^0 \pi^+ (\nu_\mu \nu_e)$	$(1-10-1) \rightarrow (01-1-1) + (1-100) + (0-100) + (0010)$
$\Sigma^- \rightarrow n^0 \pi^-$	$\Sigma^- \rightarrow n^0 \pi^- (\nu_\mu \nu_e)$	$(-110-1) \rightarrow (01-1-1) + (-1100) + (0-100) + (0010)$
$\Xi^0 \rightarrow \Lambda^0 \gamma$	$\Xi^0 \rightarrow \Lambda^0 \gamma (\nu_\mu \nu_e)$	$(0-11-1) \rightarrow (000-1) + (0000) + (0-100) + (0010)$
$\Xi^- \rightarrow \Lambda^0 \pi^-$	$\Xi^- \rightarrow \Lambda^0 \pi^- (\nu_\mu \nu_e)$	$(-101-1) \rightarrow (000-1) + (-1100) + (0-100) + (0010)$
$\Omega^- \rightarrow \Lambda^0 \bar{K}^-$	$\Omega^- \rightarrow \Lambda^0 \bar{K}^- (\nu_\mu \nu_e)$	$(-1-12-1) \rightarrow (000-1) + (-1010) + (0-100) + (0010)$
$\Omega^- \rightarrow \Xi^0 \pi^-$	$\Omega^- \rightarrow \Xi^0 \pi^- (\nu_\mu \nu_e)$	$(-1-12-1) \rightarrow (0-11-1) + (-1100) + (0-100) + (0010)$
$\Omega^- \rightarrow \Xi^- \pi^0$	$\Omega^- \rightarrow \Xi^- \pi^0 (\nu_\mu \nu_e)$	$(-1-12-1) \rightarrow (-101-1) + (0000) + (0-100) + (0010)$

Commonly Stated and Proposed Reaction Statement	Balanced (qmsc) Description
$n^0 + p^+ \rightarrow p^+ p^+ \pi^-$	$(01-1-1) + (10-1-1) \rightarrow (10-1-1) + (10-1-1) + (-1100)$
$\pi^- + p^+ \rightarrow n^0 \pi^0$	$(-1100) + (10-1-1) \rightarrow (01-1-1) + (0000)$
$\mu^- + p^+ \rightarrow n^0 \nu_\mu$	$(-1110) + (10-1-1) \rightarrow (01-1-1) + (0010)$
$\bar{K}^- + p^+ \rightarrow \Sigma^+ \pi^-$	$(-1010) + (10-1-1) \rightarrow (1-10-1) + (-1100)$
$\bar{K}^- + p^+ \rightarrow \Sigma^- \pi^+$	$(-1010) + (10-1-1) \rightarrow (-110-1) + (1-100)$
$\pi^- + p^+ \rightarrow \Lambda^0 \bar{K}^0$	$(-1100) + (10-1-1) \rightarrow (000-1) + (01-10)$
$p^+ + p^+ \rightarrow \Xi^0 p^+ \bar{K}^0 \bar{K}^+$	$(10-1-1) + (10-1-1) \rightarrow (0-11-1) + (10-1-1) + (01-10) + (10-10)$
$\bar{K}^- + p^+ \rightarrow \Omega^- \bar{K}^0 \bar{K}^+$	$(-1010) + (10-1-1) \rightarrow (-1-12-1) + (01-10) + (10-10)$

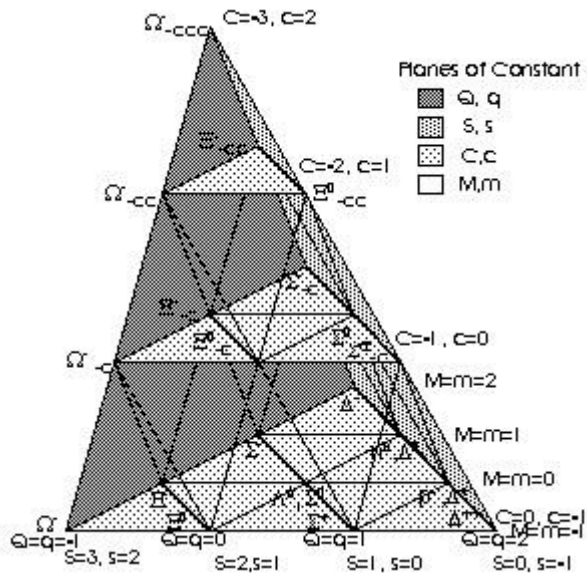


http://home.nycap.rr.com/leptonjim/physics/l_model/fl.html

Particle	Lepton Excess/Charge				Isospin I_3	Uphish-ness U	Downish-ness D	Anti-strange-ness S	Charm C
	e^+	ν_e	ν_μ	ν_τ					
	q	m	s	c					
D^0	0	1	0	-1	-1/2	-1	0	0	1
y^0	0	0	1	-1	0	-1	-1	1	1
D^+	1	0	0	-1	+1/2	0	-1	0	1
D^-	-1	0	0	1	-1/2	0	1	0	-1
y^0	0	0	-1	1	0	1	1	-1	-1
D^0	0	-1	0	1	1/2	1	0	0	-1
ϕ, ψ	0	0	0	0	0	0	0	0	0
x^-	-1	1	1	-1	-1	-2	0	1	1
F^+	1	1	-1	-1	0	0	0	-1	1
z^+	1	-1	1	-1	1	0	-2	1	1
z^-	-1	1	-1	1	-1	0	2	-1	-1
F^-	-1	-1	1	1	0	0	0	1	-1
x^+	1	-1	-1	1	1	2	0	-1	-1

Commonly Stated Reaction	Proposed Reaction Statement	Balanced (qmsc) Description
$D^0 \rightarrow K^- \pi^+$	$D^0 \rightarrow K^- \pi^+ (\nu_e \nu_\mu) (\nu_e \nu_\tau)$	$(010-1) \rightarrow (-1010) + (1-100) + 2x(0100) + (00-10) + (000-1)$
	or	or
	$D^0 \rightarrow y^0 (\nu_e \nu_\mu)$	$(010-1) \rightarrow (001-1) + (0100) + (00-10)$
	then	then
	$y^0 \rightarrow K^- \pi^+ (\nu_e \nu_\tau)$	$(001-1) \rightarrow (-1010) + (1-100) + (0100) + (000-1)$
$D^0 \rightarrow K^0 \pi^+ \pi^+ \pi^- \pi^-$	$D^0 \rightarrow K^0 \pi^+ \pi^+ \pi^- \pi^- (\nu_\mu \nu_\tau)$	$(0-101) \rightarrow (0-110) + 2x(1-100) + 2x(-1100) + (00-10) + (0001)$
$\varphi \rightarrow \phi \gamma$	$\varphi \rightarrow \phi \gamma (\nu_e \nu_\tau)$	$(0000) \rightarrow (010-1) + (0-100) + (0001)$
$B^- \rightarrow D^0 \pi^-$	$B^- \rightarrow D^0 \pi^- (\nu_e \nu_\mu)$	$(-111-1) \rightarrow (010-1) + (-1100) + (0-100) + (0010)$
$B^0 \rightarrow D^0 \pi^+ \pi^-$	$B^0 \rightarrow D^0 \pi^+ \pi^- (\nu_e \nu_\mu)$	$(00-11)(0-101) \rightarrow (1-100) + (-1100) + (0100) + (00-10)$

Particle	Lepton Excess/Charge				Isospin I_3	Uph- ish- ness U	Down- ish- ness D	Anti- strange- ness S	Charm C
	e^+	ν_e	ν_μ	ν_τ					
	q	m	s	c					
Σ_{-c}^-	-1	1	-1	0	-1	1	3	0	-1
Σ_{-c}^0	0	0	-1	0	0	2	2	0	-1
Σ_{-c}^+	1	-1	-1	0	1	3	1	0	-1
Ξ_{-c}^-	-1	0	0	0	-1/2	1	2	1	-1
Ξ_{-c}^0	0	-1	0	0	+1/2	2	1	1	-1
Ω_{-c}^-	-1	-1	1	0	0	1	1	2	-1
Ξ_{-2c}^-	-1	0	-1	1	-1/2	2	3	0	-2
Ξ_{-2c}^0	0	-1	-1	1	+1/2	3	2	0	-2
Ω_{-2c}^-	-1	-1	0	1	0	2	2	1	-2
Ω_{-3c}^-	-1	-1	-1	2	0	3	3	0	-3

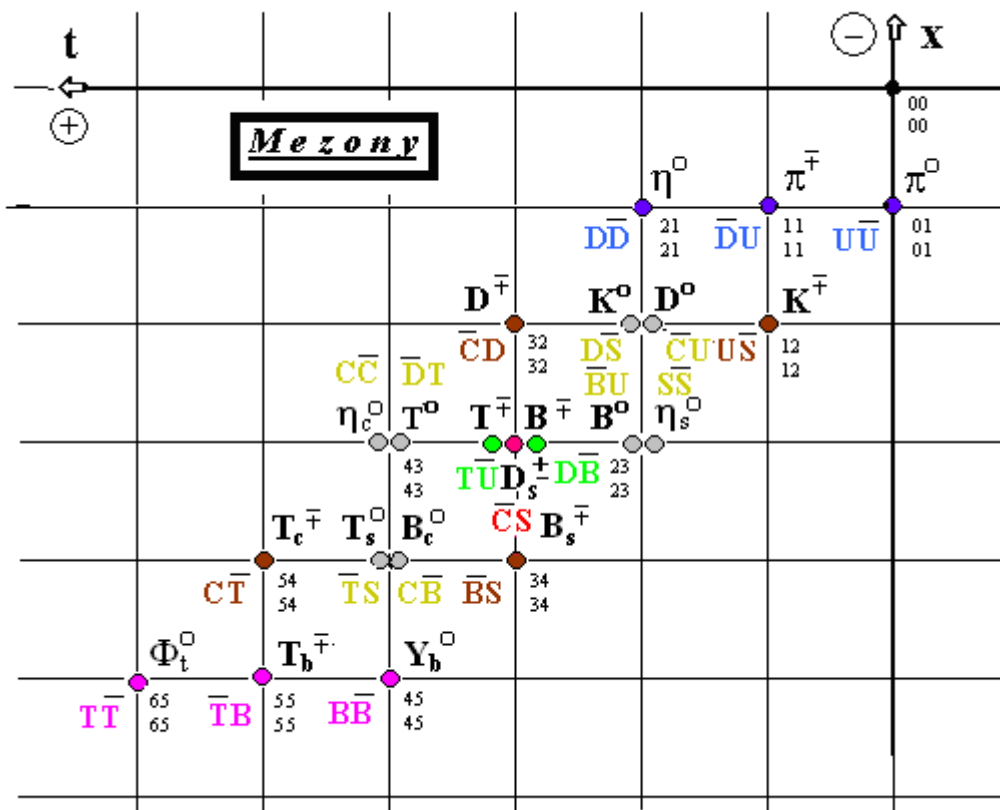


Particle	Lepton Excess/Charge				Isospin I_3	Uphishness U	Downishness D	Anti-strangeness S	Charm C
	e^+	ν_e	ν_μ	ν_τ					
	q	m	s	c					
	0	2	-1	-2	-1	0	2	0	1
Λ_c^+	1	1	-1	-2	0	1	1	0	1
Σ_c^{++}	2	0	-1	-2	1	2	0	0	1
	0	1	0	-2	-1/2	0	1	1	1
	1	0	0	-2	+1/2	1	0	1	1
	0	0	1	-2	0	0	0	2	1
	1	2	-1	-3	-1/2	0	1	0	2
	2	1	-1	-3	+1/2	1	0	0	2
	1	1	0	-3	0	0	0	1	2
	2	2	-1	-4	0	0	0	0	3

Commonly Stated Reaction	Proposed Reaction Statement	Balanced (qmsc) Description
$\nu_{\mu}+p^{+} \rightarrow \Sigma_c^{++}\mu^{-}$	$\nu_{\mu}+p^{+} \rightarrow \Sigma_c^{++}\mu^{-}(\nu_e\nu_{\tau})$	(0010)+(10-1-1)→(20-1-2)+(-1110)+(0-100)+(0001)
then	then	then
$\Sigma_c^{++} \rightarrow \Lambda_c^{+}\pi^{+}$	$\Sigma_c^{++} \rightarrow \Lambda_c^{+}\pi^{+}$	(20-1-2)→(11-1-2)+(1-100)
then	then	then
$\Lambda_c^{+} \rightarrow \Lambda^0\mu^{+}\nu$	$\Lambda_c^{+} \rightarrow \Lambda^0\mu^{+}\nu_e(\nu_e\nu_{\tau})$	(11-1-2)→(000-1)+(1-1-10)+2x(0100)+(000-1)
or	or	or
$\Lambda_c^{+} \rightarrow \Lambda^0\pi^{+}\pi^{+}\pi^{-}$	$\Lambda_c^{+} \rightarrow \Lambda^0\pi^{+}\pi^{+}\pi^{-}(\nu_e\nu_{\mu})(\nu_e\nu_{\tau})$	(11-1-2)→(000-1)+2x(1-100)+(-1100)+2x(0100)+(00-10)+(000-1)

Commonly Stated Reaction	Proposed Reaction Statement	Balanced (qmsc) Description
$\nu_{\mu}+p^{+} \rightarrow \Sigma_c^{++}\mu^{-}$	$\nu_{\mu}+p^{+} \rightarrow \Delta^{++*}\mu^{-}$	(0010)+(10-1-1)→(2-1-1-1)+(-1110)
then	then	then
$\Sigma_c^{++} \rightarrow \Lambda_c^{+}\pi^{+}$	$\Delta^{++*} \rightarrow \Delta^{+*}\pi^{+}$	(2-1-1-1)→(10-1-1)+(1-100)
then	then	then
$\Lambda_c^{+} \rightarrow \Lambda^0\mu^{+}\nu$	$\Delta^{+*} \rightarrow \Lambda^0\mu^{+}\nu_e$	(10-1-1)→(000-1)+(1-1-10)+(0100)
or	or	or
$\Lambda_c^{+} \rightarrow \Lambda^0\pi^{+}\pi^{+}\pi^{-}$	$\Delta^{+*} \rightarrow \Lambda^0\pi^{+}\pi^{+}\pi^{-}(\nu_e\nu_{\mu})$	(10-1-1)→(000-1)+2x(1-100)+(-1100)+(0100)+(00-10)

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http://home.nycap.rr.com/leptonjm/physics/l_model/intro.html



Takto postavil tabulku mezonů (ve snaze o symetrii pan Bc. D. Zoevistian) v r. 2004 ZOE se zamlžující pravou pyramidální symetrií :

	d^-	u^-	s^-	c^-	b^-	t^-
d	η^0	π^{+-}	K^0	D^{+-}	B^0	T^{+-}
u		π^0	K^{+-}	D^0	B^{+-}	T^0
s			η_s^0	D_s^{+-}	B_s^0	T_s^{+-}
c				η_c^0	B_c^{+-}	T_c^0
b					Y_b^0	T_b^{+-}
t						Φ_t^0