$^{2}_{1}\mathrm{H} + {}^{2}_{1}\mathrm{H} \to {}^{3}_{2}\mathrm{He} + \mathrm{n} + \text{energie}$

$^{1}_{1}\mathrm{H} + {}^{3}_{1}\mathrm{H} \to {}^{4}_{2}\mathrm{He} + \text{energie}$

$\mathrm{n} + {}^{14}_{7}\mathrm{N} \to {}^{14}_{6}\mathrm{C} + \mathrm{p}$

$\mathrm{n} + {}^{235}_{92}\mathrm{U} \to$ 2 menší jádra + 2 až 3 neutrony + energie

---

$^2H_1$ + $^2H_1$ => $^3He_2$ + n + energie

p.n . p.n => $p^2.n^1.e^{-2}$. n . „gama“

1 = e^{-2} . γ^2

1 = e^{-2} + 2γ (platí)

$$1 = \frac{x^4 . t^4}{x^4 . t^2} . \frac{x^4 . t^4}{x^4 . t^6} \qquad \frac{8\ 8}{8\ 8}$$

- -

$^1H_1$ + $^3H_1$ = $^4He_2$ + energie

p . pn^2 = $p^2n^2e{-}^2$. γ^2

1 = e^{-2} + 2γ (platí)

znamená to ovšem, že sloučením jader vznikne atom….a do interakce odkudsi vstupují i elektrony

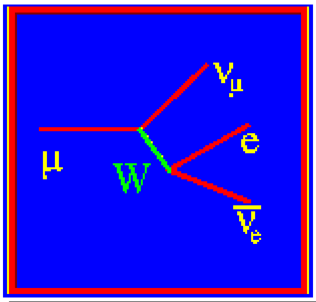
- -

n + $^{14}{}_7$N => $^{14}{}_6$C + p

n + $p^7.n^7.e^{-7}$ => $p^6.n^8.e^{-6}$ + p

e^- ≠ 1 /to není dobrá rovnováha/

-----…



Sample	N_D	f_{B0}, %	f_{B+}, %	$f_{c\bar{c}}$, %
eD^+	258 ± 22	66.0	20^{+4}_{-7}	14 ± 4
μD^+	202 ± 22	64.0	19^{+4}_{-7}	17 ± 5
eD^{+*}	185 ± 24	71.0	15 ± 7	14 ± 4
μD^{+*}	173 ± 21	68.0	15 ± 7	17 ± 5

$D^+ \to K^-\pi^+\pi^+$

$D^{+(*)} \to K^-\pi^+\pi^+$

$$\frac{x^2 . t^3}{x^2 . t^3} = \frac{x^2 . t^1}{x^2 . t^1} . \frac{x^1 . t^1}{x^1 . t^1} . \frac{x^1 . t^1}{x^1 . t^1} \qquad \frac{(6\ 6)}{(6\ 6)}$$

$$D^0 = K^- + \pi^+ \; ; \qquad D^{*+} = D^0 + \pi^+ \; ; \qquad D^0 = K^- + K^+$$

$$\frac{x^2 . t^2}{x^2 . t^2} = \frac{x^2 . t^1}{x^2 . t^1} . \frac{x^1 . t^1}{x^1 . t^1} \quad \frac{5\;4}{5\;4} \qquad \frac{x^2 . t^3}{x^2 . t^3} = \frac{x^2 . t^2}{x^2 . t^2} . \frac{x^1 . t^1}{x^1 . t^1} \quad \frac{5\;6}{5\;6} \qquad \frac{x^2 . t^2}{x^2 . t^2} = \frac{x^2 . t^2}{x^2 . t^2} . \frac{x^2 . t^2}{x^2 . t^2} \quad \frac{6\;6}{6\;6}$$

zde je vidět, že rozlišovací činitel bude nutno dodat ; ten neznám.

$\Xi = \Omega + K$ pro tuto interakci mi literatura nezadala náboje, takže vyzkouším všechny v úvahu připadající možnosti (je jich pouze 6.mám-li ctít "hladiny"v interakci):

a) $\Xi^0 = \Omega^- + K^+$

$$\frac{x^5 . t^1}{x^2 . t^3} = \frac{x^6 . t^2}{x^3 . t^4} . \frac{x^2 . t^1}{x^2 . t^1} \qquad \frac{10\;\;6}{10\;\;6}$$

b) $\Xi^- = \Omega^- + K^0$

$$\frac{x^5 . t^2}{x^2 . t^4} = \frac{x^6 . t^2}{x^3 . t^4} . \frac{x^2 . t^2}{x^2 . t^2} \qquad \frac{10\;\;8}{10\;\;8}$$

c) $\Xi_c^+ = \Omega_c^0 + K^+$

$$\frac{x^5 . t^2}{x^2 . t^4} = \frac{x^6 . t^3}{x^3 . t^5} . \frac{x^2 . t^1}{x^2 . t^1} \qquad \frac{10\;\;8}{10\;\;8}$$

d) $\Xi_c^0 = \Omega_c^0 + K^0$

$$\frac{x^5 . t^3}{x^2 . t^5} = \frac{x^6 . t^3}{x^3 . t^5} . \frac{x^2 . t^2}{x^2 . t^2} \qquad \frac{10\;\;10}{10\;\;10}$$

(zde rovnováha)

e) $\Xi_{cc}^{++} = \Omega_{cc}^+ + K^+$

$$\frac{x^5 . t^3}{x^2 . t^5} = \frac{x^6 . t^4}{x^3 . t^6} . \frac{x^2 . t^1}{x^2 . t^1} \qquad \frac{10\;\;10}{10\;\;10}$$

(zde rovnováha)

f) $\Xi_{cc}^+ = \Omega_{cc}^+ + K^0$

$$\frac{x^5 . t^4}{x^2 . t^6} = \frac{x^6 . t^4}{x^3 . t^6} . \frac{x^2 . t^2}{x^2 . t^2} \qquad \frac{10\;\;12}{10\;\;12}$$

je vidět, že pro rovnováhu připadají interakce : $\Xi_c^0 = \Omega_c^0 + K^0$; $\Xi_{cc}^{++} = \Omega_{cc}^+ + K^+$ **,** ostatní jsou nepravé rovnováhy.

Interakci $\Omega^* = \Xi + K^-$ lze realizovat (má-li se zachovat zák.zachování nábojové rovnováhy)

ve třech možnostech : $\Omega^- = \Xi^0 + K^-$

$$\frac{x^6 . t^2}{x^3 . t^4} = \frac{x^5 . t^1}{x^2 . t^3} . \frac{x^2 . t^1}{x^2 . t^1} \qquad \begin{matrix} 10 \ \ 6 \\ 10 \ \ 6 \end{matrix}$$

$\Omega_c^0 = \Xi_c^+ + K^-$

$$\frac{x^6 . t^3}{x^3 . t^5} = \frac{x^5 . t^2}{x^2 . t^4} . \frac{x^2 . t^1}{x^2 . t^1} \qquad \begin{matrix} 10 \ \ 8 \\ 10 \ \ 8 \end{matrix}$$

$\Omega_{cc}^+ = \Xi_{cc}^{++} + K^-$

$$\frac{x^6 . t^4}{x^3 . t^6} = \frac{x^5 . t^3}{x^2 . t^5} . \frac{x^2 . t^1}{x^2 . t^1} \qquad \begin{matrix} 10 \ \ 10 \\ 10 \ \ 10 \end{matrix} \qquad \text{(rovnováha)}$$

…a tak bych podle mých "názorů" navrhoval interakci $\Omega_{cc}^+ = \Xi_{cc}^{++} + K^-$

$\bar{b} \to l^+X,\ \bar{B}_d^0 \to D^{+(*)}X$

???????? $\Xi \sum \Omega$;

$$\frac{x^2. t^3}{x^2. t^3} = \frac{x^2. t^2}{x^2. t^2} . \frac{x^1. t^1}{x^1. t^1} \quad \begin{matrix} (5\ 6) \\ (5\ 6) \end{matrix} \qquad \frac{x^2. t^2}{x^2. t^2} = \frac{x^2. t^1}{x^2. t^1} . \frac{x^1. t^1}{x^1. t^1} \quad \begin{matrix} (5\ 4) \\ (5\ 4) \end{matrix}$$

$D^{*+} \to D^0\pi^+, D^0 \to K^-\pi^+$

a tak se mi tyto interakce moc nelíbí,není zde "pravá" rovnováha

---

$\bar{B}_d^0 \to D^{*+}X,\ D^{*+} \to D^0\pi^+, D^0 \to K^-\pi^+$

$$D^{+*} \to D^0\pi_s^+, D^0 \to K^-\pi^+.$$
$$B \to \bar{D}X \to l^-X.$$

..

$$\bar{b} \to l^+X, \bar{B}^0 \to D^{+(*)}X$$
$$\bar{b} \to l^+X, \bar{B}^0 \to B^0 \to D^{-(*)}X,$$
$$B^- \to D^{+(*)}X.$$
$$c \to D^{+(*)}X, \bar{c} \to l^-X.$$

	$\bar{b} \to l^+X$	$\bar{b} \to B^0 \to \bar{B}^0 \to l^-X$	$\bar{b} \to c \to l^-X$	$\bar{c} \to l^-X$
$\bar{B}^0 \to D^{+(*)}X$	rs	ws	ws	0
$\bar{B}^0 \to B^0 \to D^{-(*)}X$	ws	rs	rs	0
$\bar{B}^- \to D^{+(*)}X$	rs	ws	ws	0
$c \to D^{+(*)}X$	0	0	0	ws
combinatorics	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$

$b \to \bar{B}_d^0 \to D^+X,\ D^+ \to K^-\pi^+\pi^+$

$b \to \bar{B}_d^0 \to D^{*+}X,\ D^{*+} \to D^0\pi^+, D^0 \to K^-\pi^+$ $B_d^0 \to K^{*0}\gamma$??

možná by mělo být v interakci, že odlétají fotony i antifotony čili $B_d^0 = K^{*0} + \gamma + \gamma^-$ a to pak už je dobře

$$B_d^0 = K^{*0} + \gamma + \gamma^-$$

$$\frac{x^3.\,t^2}{x^3.\,t^2} = \frac{x^2.\,t^2}{x^2.\,t^2} \cdot \frac{x^2.\,t^2}{x^2.\,t^3} \cdot \frac{x^2.\,t^3}{x^2.\,t^2} \qquad \begin{matrix}(9\ 9)\\(9\ 9)\end{matrix}$$

A) $$K^{*0} = K^+ + \pi^-$$

$$\frac{x^2.\,t^2}{x^2.\,t^2} = \frac{x^2.\,t^1}{x^2.\,t^1} \cdot \frac{x^1.\,t^1}{x^1.\,t^1} \qquad \begin{matrix}5\ 4\\5\ 4\end{matrix} \qquad ?$$

B) $$D^0 = K^- + \pi^+$$

$$\frac{x^2.\,t^2}{x^2.\,t^2} = \frac{x^2.\,t^1}{x^2.\,t^1} \cdot \frac{x^1.\,t^1}{x^1.\,t^1} \qquad \begin{matrix}5\ 4\\5\ 4\end{matrix} \qquad ?$$

což je zajímavé, že interakce typu A) a B) jsou identické (asi s rozdílem v nějakých parametrech) ……..

$B_d^0 \to K^{*0}\gamma, K^{*0} \to K^+\pi^-$

$\mathcal{BR}(B_d^0 \to K^{*0}\gamma, K^{*0} \to K^+\pi^-) < 2.2 \times 10^{-4} \quad (@90\%\ \ C.L)$

	$B_d^0 \to K^{*0}\gamma$	$B_s^0 \to \phi\gamma$
$\int Ldt(\phi\gamma)/\int Ldt(eD^0X)$	17.05/23.28	
$N(eD^0X)$ (events)	61 ± 11	
$\mathcal{BR}(B \to e^-D^0X)$	0.0699 ± 0.0142	
$\mathcal{BR}(D^0 \to K^-\pi^+)$	0.0383 ± 0.0012	
$\mathcal{BR}(K^{*0} \to K^+\pi^-)$	2/3	$--$
$\mathcal{BR}(\phi \to K^+K^-)$	$--$	0.491 ± 0.006
$f_s/(f_u, f_d)$	$0.34 \pm 0.10 \pm 0.03$	
$\epsilon(eD^0)/\epsilon(K^{*0}\gamma)$	0.500 ± 0.095	$--$
$\epsilon(eD^0)/\epsilon(\phi\gamma)$	$--$	0.342 ± 0.070

$B \to e^-D^0X$

$\mathcal{BR}(B_s^0 \to \phi\gamma) < 3.9 \times 10^{-4} \quad (@90\%\ \ C.L)$

$b \to s\gamma$

$$b \dashrightarrow s\,.\,\gamma\ □.\,\gamma^- \qquad \frac{x^3.\,t^{5/3}}{x^2.\,t^{7/3}} = \frac{x^2.\,t^{2/3}}{x^1.\,t^{4/3}} \cdot \frac{x^2.\,t^2}{x^2.\,t^3} \cdot \frac{x^2.\,t^3}{x^2.\,t^2} \qquad \begin{matrix}(8\ \ 8)\\(8\ \ 8)\end{matrix}$$

opět by zde mělo platit, že z reakce odlétají fotony i antifotony

$K^{*0} \to K^+\pi^-$

$B_s^0 \to \phi\gamma$

$\phi \to K^+K^-$

$B_s^0 \to \phi\gamma, \phi \to K^+K^-$

$\mathcal{BR}(B_s^0 \to \phi\gamma, \phi \to K^+K^-) < 3.9 \times 10^{-4}$ (@90% $C.L$)

$\phi = K^+ + K^-$

$$\frac{x^3.\,t^2}{x^3.\,t^2} = \frac{x^2.\,t^1}{x^2.\,t^1} \cdot \frac{x^2.\,t^1}{x^2.\,t^1} \qquad \frac{7\ 4}{7\ 4} \qquad ?$$

$B_s^0 = \phi + \gamma$

$$\frac{x^3.\,t^4}{x^3.\,t^4} = \frac{x^3.\,t^2}{x^3.\,t^2} \cdot \frac{x^2.\,t^2}{x^2.\,t^3} \qquad \frac{8\ 8}{8\ 9} \qquad ?$$

lépe je interakci doplnit na foton plus antifoton :

$B_s^0 = \phi + \gamma + \gamma^-$

$$\frac{x^3.\,t^4}{x^3.\,t^4} = \frac{x^3.\,t^2}{x^3.\,t^2} \cdot \frac{x^2.\,t^2}{x^2.\,t^3} \cdot \frac{x^2.\,t^3}{x^2.\,t^2} \qquad \frac{10\ 11}{10\ 11}$$

……i když i to není pravá rovnováha

$\bar{B}_s^0 \to J/\psi\phi$

$$\frac{x^3.\,t^4}{x^3.\,t^4} = \frac{x^3.\,t^4}{x^3.\,t^4} \cdot \frac{x^3.\,t^2}{x^3.\,t^2} \qquad \frac{9\ 10}{9\ 10} \qquad ?$$

$\Lambda_c^+ \to K^-p\pi^+$

$$\frac{x^4.\,t^2}{x^1.\,t^4} = \frac{x^2.\,t^1}{x^2.\,t^1} \cdot \frac{x^3.\,t^0}{x^0.\,t^2} \cdot \frac{x^1.\,t^1}{x^1.\,t^1} \qquad \frac{7\ 6}{7\ 6} \qquad ?$$

$\Lambda_c^+ = K^+ + p + \pi^-$

$$\frac{x^4.\,t^2}{x^1.\,t^4} = \frac{x^2.\,t^1}{x^2.\,t^1} \cdot \frac{x^3.\,t^0}{x^0.\,t^2} \cdot \frac{x^1.\,t^1}{x^1.\,t^1} \qquad \frac{7\ 6}{7\ 6} \qquad ?$$

$\Lambda_c^+ = K^+ + n + \pi^0$

$$\frac{x^4.\,t^2}{x^1.\,t^4} = \frac{x^2.\,t^1}{x^2.\,t^1} \cdot \frac{x^3.\,t^1}{x^0.\,t^3} \cdot \frac{x^1.\,t^2}{x^1.\,t^2} \qquad \frac{7\ 8}{7\ 8} \qquad ?$$

zde je něco záhadného….že zde "se " rovnováha přeskočí :??

$B_c^- \to J/\psi\ell^-X$ $\quad$ $\bar{B}_s^0 \to \ell^-D_s^+X$

$\ell = e, \mu$ $\quad$ $J/\psi \to \mu^+\mu^-$ $\quad$ $B \to J/\psi K$ $\quad$ $B \to J/\psi X$

$B \to \psi(2S)K$

$^{3}H = {}^{3}He + e^{-} + \nu_e^{-}$ (? ? ? ? co to je)

$p.\, n^2.e^{-} = p^2.n \;.\; e^{-} \;.\; \nu_e$

$n = p \;.\; e^{-} \;.\; \nu_e$

$$\frac{x^3 . t^1}{x^0 . t^3} = \frac{x^3 . t^0}{x^0 . t^2} \;.\; \frac{x^2 . t^2}{x^2 . t^1} \;.\; \frac{x^0 . t^0}{x^0 . t^1}$$

$\pi = \mu^{+} + \nu_\mu$

$$\frac{x^1 . t^1}{x^1 . t^1} = \frac{x^1 . t^1}{x^1 . t^2} \;.\; \frac{x^1 . t^1}{x^1 . t^0} \qquad \frac{(3\ \ 3)}{(3\ \ 3)}$$

↳ $\mu^{+} = e^{+} + \nu_e + \nu_\mu^{-}$

$$\frac{x^1 . t^1}{x^1 . t^2} = \frac{x^2 . t^1}{x^2 . t^2} \;.\; \frac{x^0 . t^1}{x^0 . t^0} \;.\; \frac{x^1 . t^0}{x^1 . t^1} \qquad \frac{(4\ \ 4)}{(4\ \ 4)}$$

$\tau = /n/ \;.\; (\ \pi + \nu_\tau\ )$

$$\frac{x^2 . t^1}{x^2 . t^0} = n\, \frac{x^1 . t^1}{x^1 . t^1} \;.\; \frac{x^0 . t^2}{x^0 . t^1} \qquad \frac{(\ 3\ \ 3)}{(\ 3\ \ 3)}$$

$H^0 = b\, b^{-}$; $e^{+} + e^{-} = H^{+} + H^{-}$; $H^{+} = \tau^{+} + \nu_\tau$; $H^{+} = t^{*}\, b^{-} = W^{+}\, b\, b^{-}$

$D^0 = K^{+} + K^{-} = K^{-} + \pi^{+} = K^{+} + \pi^{-}$

$D^{+} = \mu^{+} + \nu_\mu$

$D_s^{+} = \phi + \ell + \nu_\ell$

.–.

$H^0 = b + b^{-}$ >>>>>>>

$$\frac{x^0 . t^1}{x^0 . t^1} = \frac{x^3 . t^{5/3}}{x^2 . t^{7/3}} \;.\; \frac{x^2 . t^{7/3}}{x^3 . t^{5/3}} \qquad \frac{5\ \ 5}{5\ \ 5}$$

$e^{+} + e^{-} = H^{+} + H^{-}$ >>>>

$$\frac{x^2 . t^1}{x^2 . t^2} \;.\; \frac{x^2 . t^2}{x^2 . t^1} = \frac{x^2 . t^1}{x^2 . t^1} \;.\; \frac{x^0 . t^2}{x^0 . t^2} \qquad \frac{6\ \ 6}{6\ \ 6}$$

$H^{+} = \tau^{+} + \nu_\tau$???????

$H^{+} = \mu^{+} + \nu_e$ >>>>>>

$$\frac{x^2 . t^1}{x^2 . t^1} = \frac{x^1 . t^1}{x^1 . t^2} \;.\; \frac{x^0 . t^1}{x^0 . t^0} \qquad \frac{3\ \ 3}{3\ \ 3}$$

$H^{+} = \tau^{+} + \nu_\tau$???????

$H^{+} = e^{+} + \nu_\tau$ >>>>>>

$$\frac{x^2 . t^1}{x^2 . t^1} = \frac{x^2 . t^1}{x^2 . t^2} \;.\; \frac{x^0 . t^2}{x^0 . t^1} \qquad \frac{4\ \ 4}{4\ \ 4}$$

$H^{+} = t^{*}\, b^{-} = W^{+}\, b\, b^{-}$

$$\frac{x^2 . t^1}{x^2 . t^1} = \frac{x^3 . t^{8/3}}{x^2 . t^{10/3}} \;.\; \frac{x^2 . t^{7/3}}{x^3 . t^{5/3}} \quad \frac{(7\ 6)}{(7\ 6)} \qquad \frac{x^2 . t^1}{x^2 . t^1} = \frac{x^2 . t^2}{x^2 . t^2} \;.\; \frac{X^5 . T^4}{X^5 . T^4}$$

$D^0 = K^{+} + K^{-} = K^{-} + \pi^{+} = K^{+} + \pi^{-}$

$x^2 . t^2 \qquad x^2 . t^1 \qquad x^2 . t^1 \quad (6\ 4) \qquad x^2 . t^1 \qquad x^1 . t^1 \quad (5\ \ 4)$

------ = ------ . ------ = ------ . ------ = dtto ? ? ? ?

$x^2 . t^2$ $x^2 . t^1$ $x^2 . t^1$ (6 4) $x^2 . t^1$ $x^1 . t^1$ (5 4)

$D^+ = \mu^+ + \nu_\mu$??? $\quad \frac{x^2 . t^3}{x^2 . t^3} = \frac{x^2 . t^0}{x^2 . t^1} . \frac{x^0 . t^1}{x^0 . t^0} \quad \frac{(4\ 4)}{(4\ 4)} \; ; \; \frac{x^2 . t^3}{x^2 . t^3} = \frac{x^1 . t^1}{x^1 . t^2} . \frac{x^1 . t^1}{x^1 . t^0} \quad \frac{(4\ 5)}{(4\ 5)}$????

$D^+ = \tau^+ + \nu_e$

$\mu^+ = e^+ + \nu_e + \nu_\mu^-$ >>>> $\quad \frac{x^1 . t^1}{x^1 . t^2} = \frac{x^2 . t^1}{x^2 . t^2} . \frac{x^0 . t^1}{x^0 . t^0} . \frac{x^1 . t^0}{x^1 . t^1} \quad \frac{4\ 4}{4\ 4}$

$K^+ = \mu^+ + \nu_\mu$
$\pi^+ = \mu^+ + \nu_\mu$
$D^+ = \mu^+ + \nu_\mu$ toto vše uvádí literatura…ač je to podivné, plyne to z toho, že fyikové postavili mezony

"takatak" z kvarků…já kvarkovou tezi přijal beze změny.

$$\mu^+ + \nu_\mu = \frac{x^1 . t^1}{x^1 . t^2} . \frac{x^1 . t^1}{x^1 . t^0} \quad \frac{(2\ 2)}{(2\ 2)}$$

$$K^+ = \frac{x^2 . t^1}{x^2 . t^1}$$

mezony K^+; π^+ ; D^+ podle určení kvarků , nejsou částicemi totožnými, a tak nemohou se rovnat $\mu^+ + \nu_\mu$

$$\pi^+ = \frac{x^1 . t^1}{x^1 . t^1}$$

$$D^+ = \frac{x^2 . t^3}{x^2 . t^3}$$

32.Nakřáplá jádra od Milana Rojka, Jiřího Dolejšího, Jana Kuchaře.(11/98)

Uvádí se zde,že *: rozpad není jedinou cestou,jak se jádra navzájem přeměňují.Může také docházet ke slučování jader a různým reakcím,například :*

$_1H^2$	+	$_1H^2$	=>	$^3{}_2He$	+	**n**	+	**energie**
p.n	.	**p.n**	=>	$p^2.n^1.e^{-2}$	.	**n**	.	**„gama“**
		1	=	e^{-2}	.			γ^2

- -

n	+	$^{14}{}_7N$	=>	$^{14}{}_6C$	+	**p**
n	.	$p^7.n^7.e^{-7}$	=>	$p^6.n^8.e^{-6}$	.	**p**
		e^-	≠	**1**		/to není rovnováha/

- -

Buď zde není správně dodržena zápisová konvence, nebo já chybně čtu zápis, anebo (se domnívám) , že takto je reakce nesprávně.

$$\mu^- = e^- + \nu_e + \nu_\mu^-$$

$$\frac{x^1 . t^2}{x^1 . t^1} = \frac{x^2 . t^2}{x^2 . t^1} . \frac{x^0 . t^1}{x^0 . t^0} . \frac{x^1 . t^0}{x^1 . t^1} \qquad \begin{matrix} 4\ 4 \\ 4\ 4 \end{matrix}$$

$$\tau^- = e^- + \nu_\tau + \nu_e^-$$

$$\frac{x^2 . t^1}{x^2 . t^0} = \frac{x^2 . t^2}{x^2 . t^1} . \frac{x^0 . t^2}{x^0 . t^1} . \frac{x^0 . t^0}{x^0 . t^1} \qquad \begin{matrix} 4\ 4 \\ 4\ 4 \end{matrix}$$

$$K^0 = \mu^- + e^+$$

$$\frac{x^2 . t^2}{x^2 . t^2} = \frac{x^1 . t^2}{x^1 . t^1} . \frac{x^2 . t^1}{x^2 . t^2} \qquad \begin{matrix} 5\ 5 \\ 5\ 5 \end{matrix}$$

$$B = (\,C \quad C^- \quad S\,)$$

$$\frac{x^3 . t^{5/3}}{x^2 . t^{7/3}} = \frac{x^2 . t^{5/3}}{x^1 . t^{7/3}} . \frac{x^1 . t^{7/3}}{x^2 . t^{5/3}} . \frac{x^2 . t^{2/3}}{x^1 . t^{4/3}} \qquad \begin{matrix} 7\ 7 \\ 7\ 7 \end{matrix}$$

$$\rho^{-+} = W^{-+} + \pi^0$$

$$\frac{x^1 . t^1}{x^1 . t^1} = \frac{x^2 . t^1}{x^2 . t^1} . \frac{x^1 . t^2}{x^1 . t^2} \qquad \begin{matrix} 4\ 4 \\ 4\ 4 \end{matrix}$$

$$\tau^- = K^- + \pi^- + \pi^+ + \pi^0 + \nu_\tau$$

$$\frac{x^2 . t^1}{x^2 . t^0} = \frac{x^2 . t^1}{x^2 . t^1} . \frac{x^1 . t^1}{x^1 . t^1} . \frac{x^1 . t^1}{x^1 . t^1} . \frac{x^1 . t^2}{x^1 . t^2} . \frac{x^0 . t^2}{x^0 . t^1}$$

$$D^+ = \mu^+ + \nu_\mu$$

$$\frac{x^2 . t^3}{x^2 . t^3} = \frac{x^1 . t^1}{x^1 . t^2} . \frac{x^1 . t^1}{x^1 . t^0} \qquad \begin{matrix} 4\ 5 \\ 4\ 5 \end{matrix}$$

$$D^0 = K^- + K^+$$

$$\frac{x^2 . t^2}{x^2 . t^2} = \frac{x^2 . t^1}{x^2 . t^1} . \frac{x^2 . t^1}{x^2 . t^1} \qquad \begin{matrix} 6\ 4 \\ 6\ 4 \end{matrix}$$

$$D^0 = K^- + \pi^+$$

$$\frac{x^2 . t^2}{x^2 . t^2} = \frac{x^2 . t^1}{x^2 . t^1} . \frac{x^1 . t^1}{x^1 . t^1} \qquad \begin{matrix} 5\ 4 \\ 5\ 4 \end{matrix}$$

$$D^+ = {}^*K^{-0} + \ell^+ + \nu_\ell$$

$$\frac{x^2 . t^3}{x^2 . t^3} = \frac{x^2 . t^2}{x^2 . t^2} . \frac{x^2 . t^1}{x^2 . t^2} . \frac{x^1 . t^1}{x^1 . t^0} \qquad \begin{matrix} 7\ 7 \\ 7\ 7 \end{matrix}$$

$$e^+ + \nu_\mu$$

$$D^+ = {}^*K^{-0} + \tau^+ + \nu_e$$

$$\frac{x^2 . t^3}{x^2 . t^3} = \frac{x^2 . t^2}{x^2 . t^2} . \frac{x^2 . t^0}{x^2 . t^1} . \frac{x^0 . t^1}{x^0 . t^0} \qquad \begin{matrix} 6\ 6 \\ 6\ 6 \end{matrix}$$

$$D_s^+ = \phi^0 + \ell^+ + \nu_\ell$$

$$\frac{x^3 . t^3}{x^3 . t^3} = \frac{x^3 . t^2}{x^3 . t^2} . \frac{x^1 . t^1}{x^1 . t^2} . \frac{x^0 . t^1}{x^0 . t^0} \qquad \begin{matrix} 4\ 4 \\ 4\ 4 \end{matrix}$$

$$D_s^+ = \phi^0 + \mu^+ + \nu_e$$

$$D_s^+ = \phi^0 + e^+ + \nu_\tau$$

$$\frac{x^3 . t^3}{x^3 . t^3} = \frac{x^3 . t^2}{x^3 . t^2} . \frac{x^2 . t^1}{x^2 . t^2} . \frac{x^0 . t^2}{x^0 . t^1} \qquad \begin{matrix} 8\ 8 \\ 8\ 8 \end{matrix}$$

$$K^+ = \pi^+ + \nu_e + \nu_e^-$$

$$\frac{x^2 . t^1}{x^2 . t^1} = \frac{x^1 . t^1}{x^1 . t^1} . \frac{x^0 . t^1}{x^0 . t^0} . \frac{x^0 . t^0}{x^0 . t^1} \qquad \begin{matrix} 3\ 3 \\ 3\ 3 \end{matrix}$$