

First Generation Fermions

Particle	Symbol	Spin	Charge	Mass (GeV)
Electron Neutrino	ν_e	1/2	0	$< 7.2 \times 10^{-9}$
Electron	e	1/2	-1	0.51×10^{-3}
Up Quark	u	1/2	2/3	$\sim 5 \times 10^{-3}$
Down Quark	d	1/2	-1/3	$\sim 9 \times 10^{-3}$

Second Generation Fermions

Particle	Symbol	Spin	Charge	Mass (GeV)
Muon Neutrino	ν_μ	1/2	0	$< 2.7 \times 10^{-4}$
Muon	μ	1/2	-1	0.106
Charm Quark	c	1/2	2/3	~ 1.35
Strange Quark	s	1/2	-1/3	~ 0.175

Third Generation Fermions

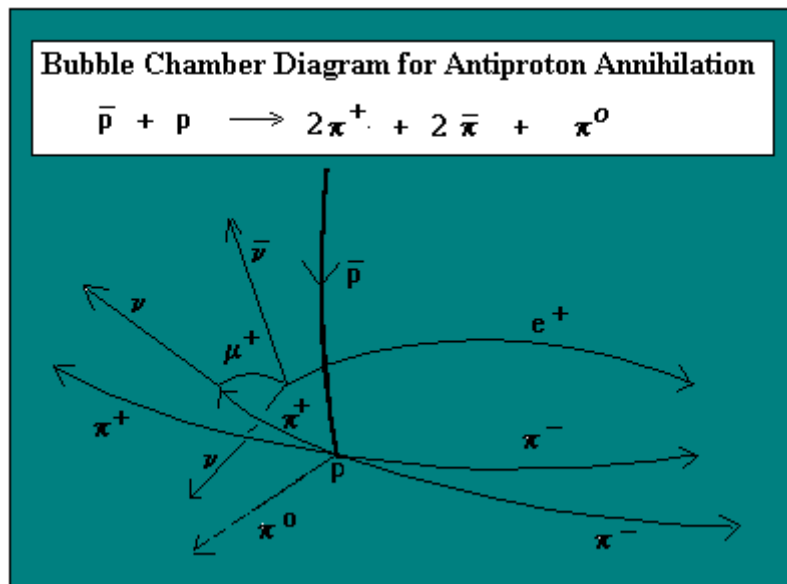
Particle	Symbol	Spin	Charge	Mass (GeV)
Tau Neutrino	ν_τ	1/2	0	$< 3 \times 10^{-2}$
Tau Lepton	t	1/2	-1	1.78
Top Quark	t	1/2	2/3	174 ± 17
Bottom Quark	b	1/2	-1/3	~ 4.5

Gauge Bosons

Particle	Symbol	Spin	Charge	Mass (GeV)
Photon	γ	1	0	0
W Boson	W	1	± 1	80.22
Z Boson	Z	1	0	91.19
Gluons	g	1	0	0

Higgs Boson

Particle	Symbol	Spin	Charge	Mass (GeV)
Higgs Boson	H	0	0	$63 < M_H < 800$



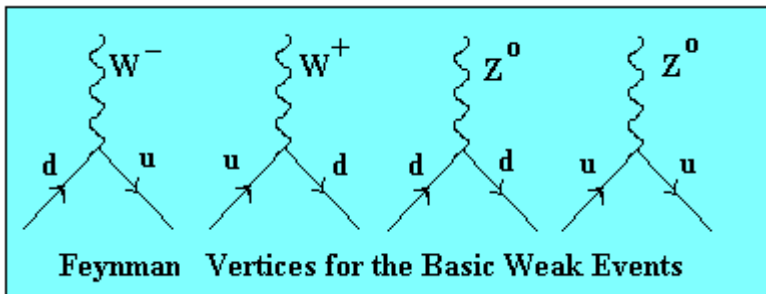
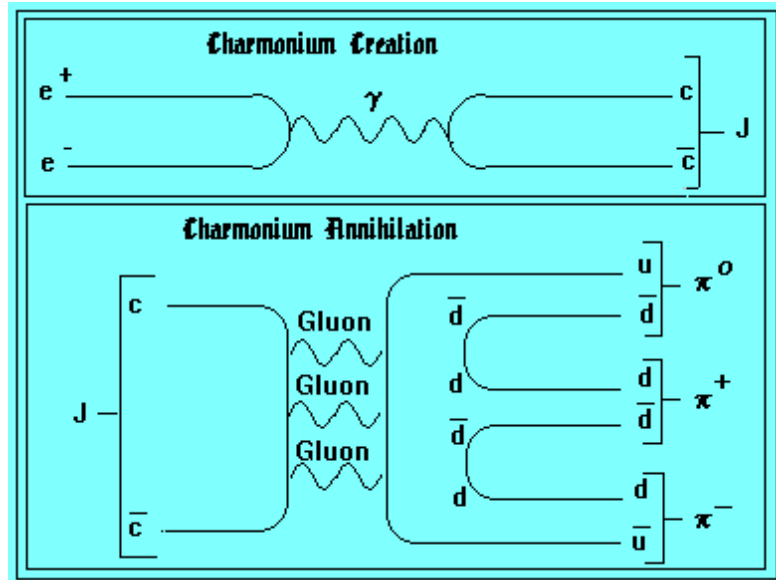
$$\frac{x^0 \cdot t^2}{x^3 \cdot t^0} \cdot \frac{x^3 \cdot t^0}{x^0 \cdot t^2} = \frac{x^2 \cdot t^2}{x^2 \cdot t^2} \cdot \frac{x^2 \cdot t^2}{x^2 \cdot t^2} \cdot \frac{x^1 \cdot t^2}{x^1 \cdot t^2} \quad (8 \ 8)$$

$K^- + p \rightarrow \Omega^- + K^+ + K^0$	$\Omega^- \rightarrow \Xi^0 + \pi^-$
<u>Charge:</u> Before: $-1 + 1 = 0$ After: $-1 + 1 + 0 = 0$	<u>Charge:</u> Before: -1 After: $-1 + 0 = -1$
<u>Baryon number:</u> Before: $1 + 0 = 1$ After: $1 + 0 + 0 = 1$	<u>Baryon number:</u> Before: 1 After: $1 + 0 = 1$
<u>Lepton number:</u> Before: $0 + 0 = 0$ After: $0 + 0 + 0 = 0$	<u>Lepton number:</u> Before: 0 After: $0 + 0 = 0$
Therefore Q, B and L are conserved.	Therefore Q, B and L are conserved.

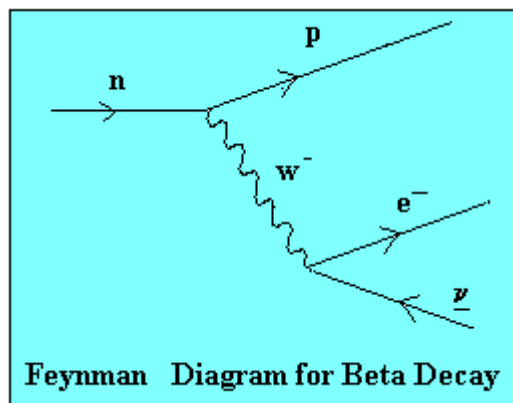
$$\frac{x^2 \cdot t^1}{x^2 \cdot t^1} \cdot \frac{x^3 \cdot t^0}{x^0 \cdot t^2} = \frac{x^6 \cdot t^2}{x^3 \cdot t^4} \cdot \frac{x^2 \cdot t^1}{x^2 \cdot t^1} \cdot \frac{x^2 \cdot t^2}{x^2 \cdot t^2} \quad (12 \ 8)$$

$$\frac{x^2 \cdot t^1}{x^2 \cdot t^1} \cdot \frac{x^3 \cdot t^0}{x^0 \cdot t^2} = \frac{x^6 \cdot t^2}{x^3 \cdot t^4} \cdot \frac{x^2 \cdot t^1}{x^2 \cdot t^1} \cdot \frac{x^2 \cdot t^2}{x^2 \cdot t^2} \quad (12 \ 8) \quad ?$$

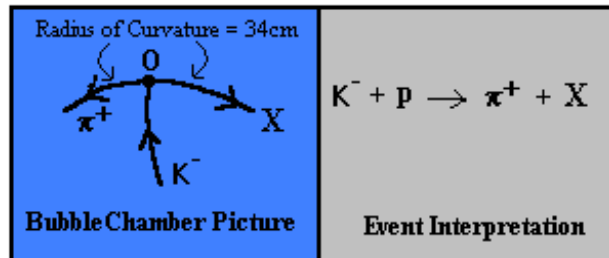
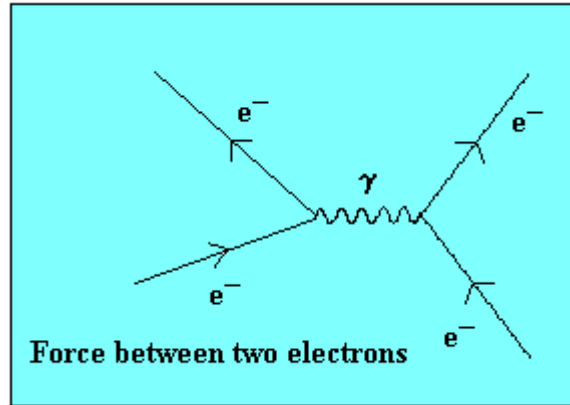
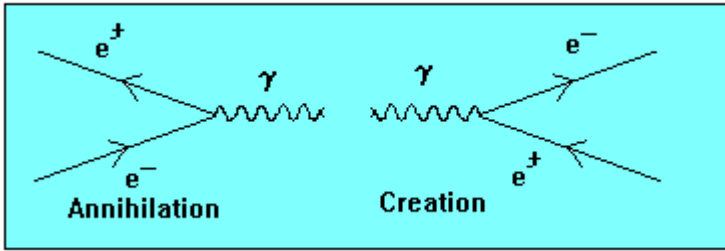
ve druhé variantě je K^+ obrácené , pak rovnováha nastane



$d + Z^0 = d$; $u + Z^0 = u$



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$$K^- + p = \pi^+ + \text{"X"} \rightarrow K^- + p = \pi^+ + \Lambda^-$$

$$\frac{x^2 \cdot t^1}{x^2 \cdot t^1} \cdot \frac{x^3 \cdot t^0}{x^0 \cdot t^2} = \frac{x^1 \cdot t^1}{x^1 \cdot t^1} \cdot \frac{x^3 \cdot t^2}{x^0 \cdot t^4} \quad (6 \ 6)$$

$$\frac{x^2 \cdot t^1}{x^2 \cdot t^1} \cdot \frac{x^3 \cdot t^0}{x^0 \cdot t^2} = \frac{x^1 \cdot t^1}{x^1 \cdot t^1} \cdot \frac{x^3 \cdot t^2}{x^0 \cdot t^4} \quad (6 \ 6) \quad ?$$

