

$$\int \psi^* H \psi dx \rightarrow \langle \psi | H | \psi \rangle = E$$



E_n

$$E^2 = p^2 + m^2$$

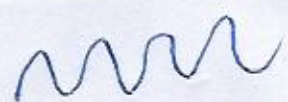
$$E = \sqrt{p^2 + m^2}$$

W^- 90 GeV.

$$\bar{\nu}_\mu \rightarrow \bar{e} \nu_e \nu_\mu$$

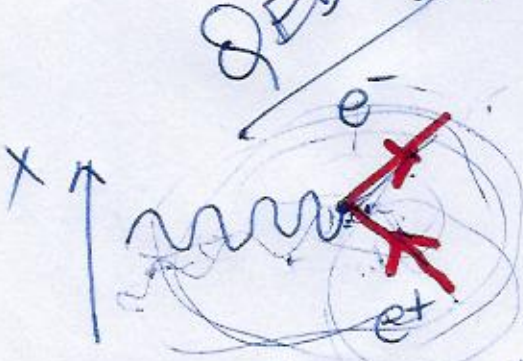
105 GeV. \uparrow e, μ inter.

e^-
 e^+



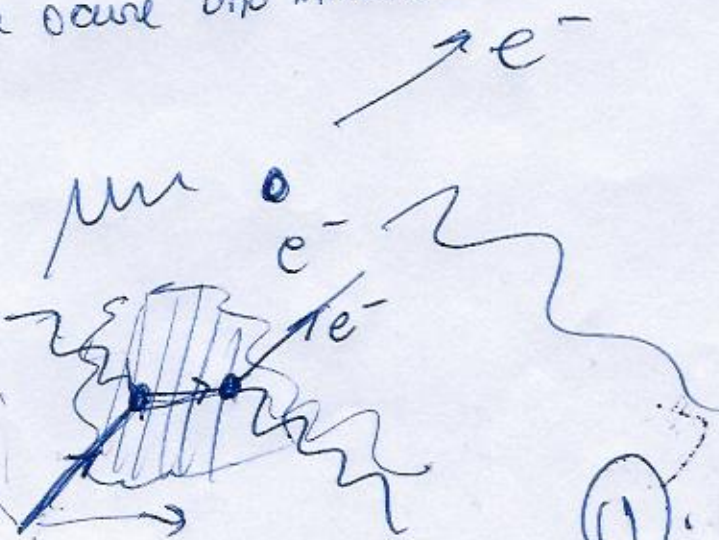
fermion antifermion

QED 1) puntos del espacio tiempo donde ocurre una interacción.



$$\Delta p \Delta x \geq \frac{\hbar}{2}$$

$$\Delta E \Delta t \geq \frac{\hbar}{2}$$



(1)

~~$$e^- \rightarrow \bar{\nu}_e$$~~

~~$$e^+ \rightarrow \nu_e$$~~

~~$$p^+ \rightarrow e^+ + \nu_e$$~~

proton es estable

Número Bariónico

$$n \rightarrow e^+ e^-$$



Nucleones:

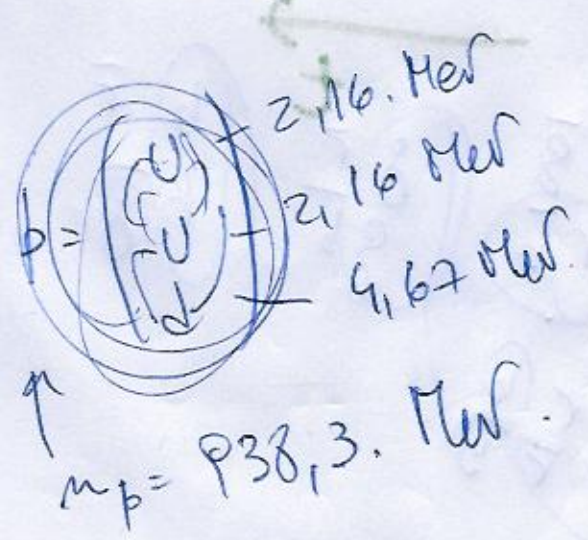
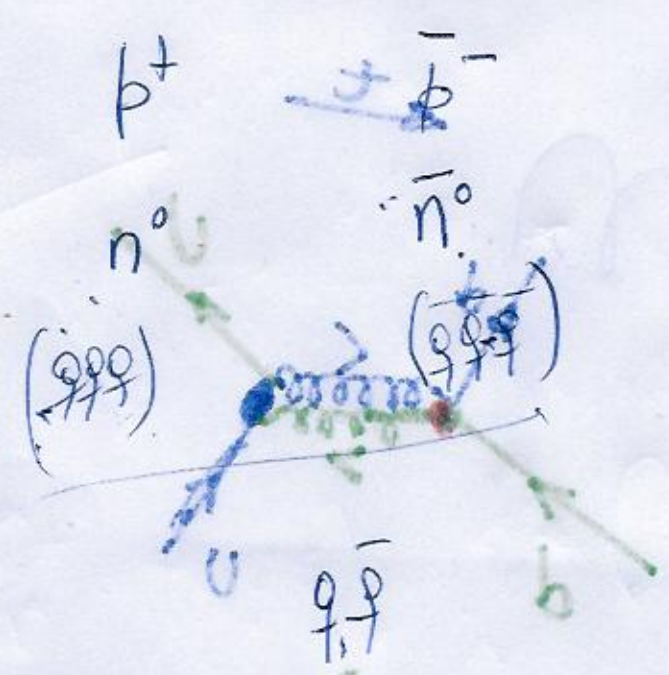
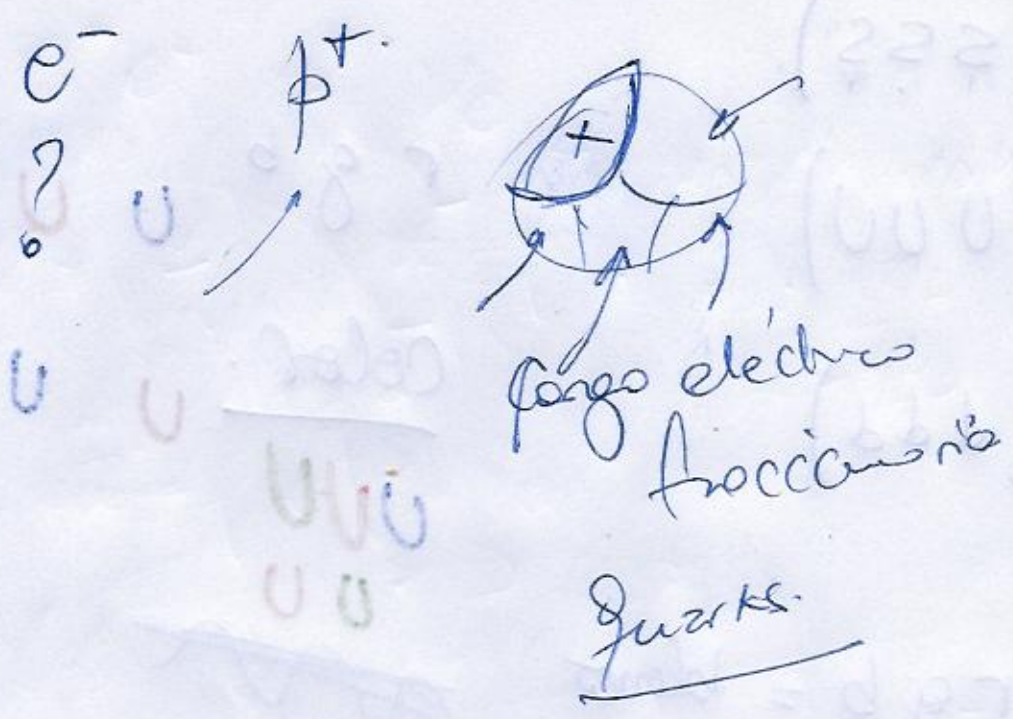
$$V_{Fe} = \frac{e^2}{4\pi\epsilon_0 r^2}$$

$$F_e = \frac{e^2}{4\pi\epsilon_0 r^2}$$

$$\pi^+ \rightarrow e^+ \nu_e$$

$$\pi^- \rightarrow e^- \bar{\nu}_e$$

(2)



$(qqq\bar{q})$ leptopion.

$(qq\bar{q}\bar{q})$ leptopion.

$$U = +2/3 \quad d = -1/3$$

$$p^+ = (u u d) \quad n^0 = (u d d)$$

$$\bar{p}^- = (\bar{u} \bar{u} \bar{d}) \quad \bar{n}^0 = (\bar{u} \bar{d} \bar{d})$$

u, d

$d \quad p^+$

n^0

$$\Delta^+ = (u u u) \quad \Delta^+ = (u u d) \quad \Delta^0 = (u d d)$$

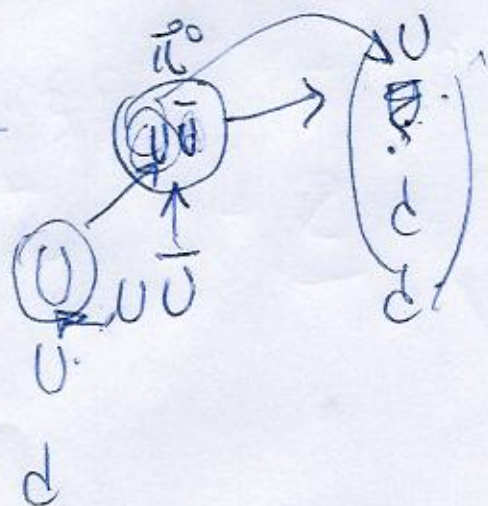
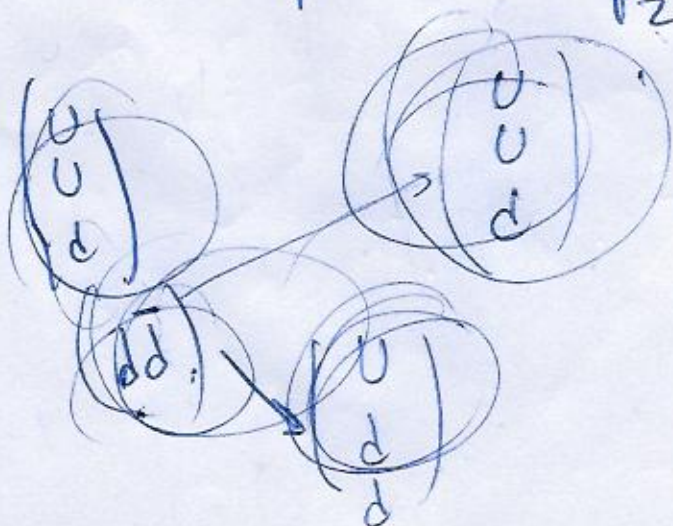
$$\Delta^- = (d d d)$$

$\pi^+ \quad \pi^- \quad \pi^0$

$$\pi^+ = (u \bar{d}) \quad \pi^- = (\bar{u} d)$$

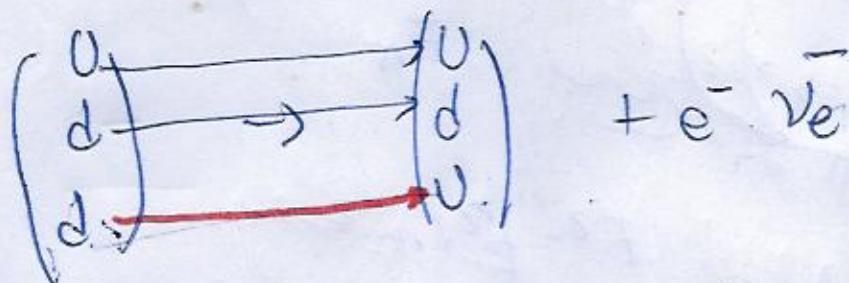
$$\pi^0 = (\bar{u} u) \quad \pi^0 = (d \bar{d})$$

$$|\pi^0\rangle = \frac{(u \bar{u}) + (d \bar{d})}{\sqrt{2}}$$

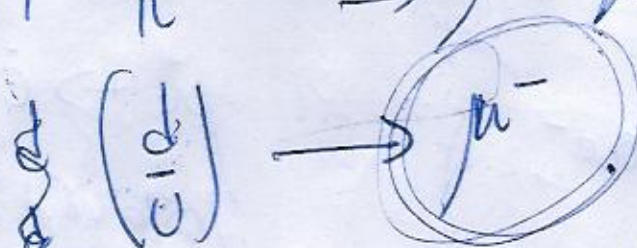


$$^{210}_{127}\text{Bi}^{83} \rightarrow ^{210}_{80}\text{Po} + e^- + \bar{\nu}_e + \gamma.$$

$$n \rightarrow p^+ + e^- + \bar{\nu}_e$$



$$-\frac{1}{3} \pi^- \rightarrow \mu^- + \bar{\nu}_\mu$$



u
u

Mesons extrins = Kaons // Mesmes K $\bar{L} \approx \bar{b} s$

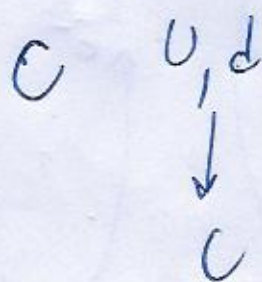
$$K^+ = \begin{pmatrix} U \\ \bar{S} \end{pmatrix} \quad \bar{K}^- = \begin{pmatrix} \bar{U} \\ S \end{pmatrix}$$

$$U = +2/3$$

$$d = -1/3$$

$$S = -1/3$$

$$K^0 = \begin{pmatrix} d \\ \bar{S} \end{pmatrix} \quad \bar{K}^0 = \begin{pmatrix} \bar{d} \\ S \end{pmatrix}$$



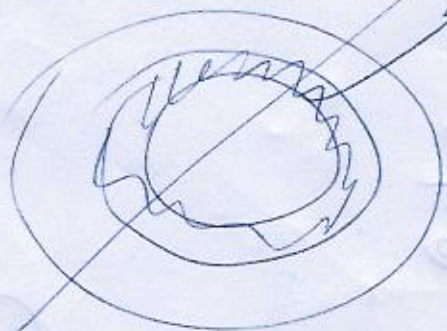
~~B~~ D S, C

Baryons : Σ U, d, S

$$\Sigma^+ = (UUS) \quad \Sigma^0 = (UdS) \quad \Sigma^- = (d d S)$$

~~not over~~

Estribes de neutrons



(6)

$$\Sigma^- = \left(\begin{smallmatrix} s & s & s \\ \bar{r} & \bar{g} & \bar{b} \end{smallmatrix} \right)$$

$$\Delta^+ = (u u u)$$

$$\Delta^- = (d d d)$$

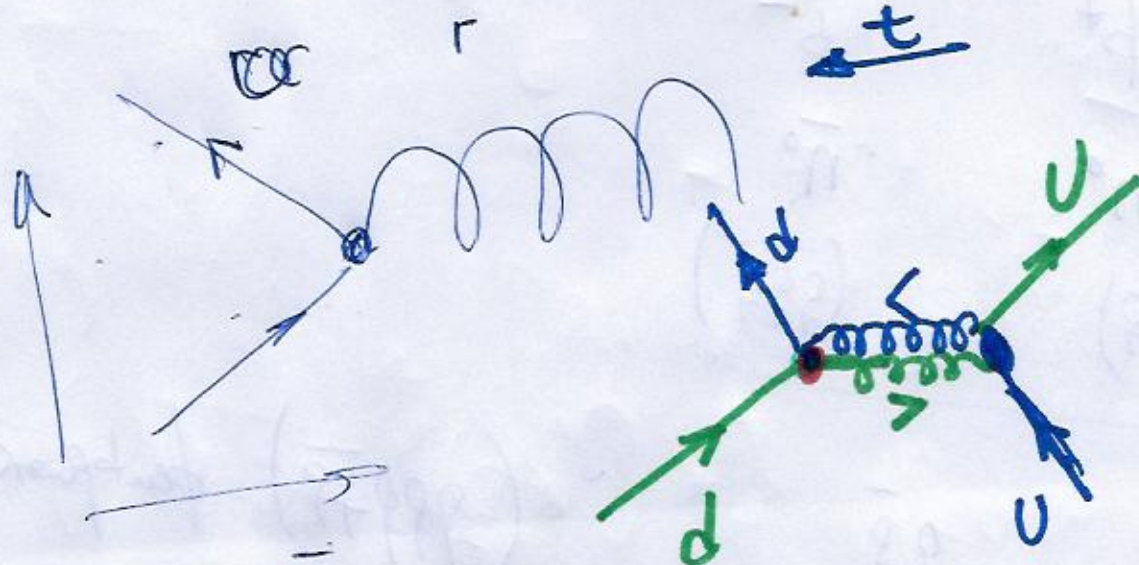
r g b u u

Color u u

u u u

u u

r g b = blanco



r g b
s | 100 | s

t
r g b
g b r
b b g

0 + 2

7

$r \bar{r} = \text{blanco.}$

$b \bar{b} = \text{blanco.}$

$g \bar{g} = \text{blanco.}$

$$\begin{pmatrix} u \\ d \end{pmatrix} = \pi^+$$

~~$r \bar{r}$~~

$$\begin{matrix} r \\ b \end{matrix} = \begin{matrix} b \\ r \end{matrix}$$

(8)