

湯川記念館 史料室 湯川 記 1955 Dec. 7, 1955 (1)

湯川 記:

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 Salam

$$Q = I_3 + \frac{n}{2} + \frac{S}{2}$$

$$\left\{ \begin{array}{l} I_3 = \frac{n_p - n_N}{2} \\ n = n_p + n_N + n_\Lambda \\ S = -n_\Lambda \\ Q = n_p \end{array} \right.$$

$\Delta n_p = 0$ charge conserv.
 $\Delta n = 0$ nucleon number conserv.

$\Delta n_\Lambda = 0$ (strong)
 $\Delta n_\Lambda = \pm 1$ (weak)

$$H = \sum_{i=1}^4 \bar{\Psi} \tau_i \Psi \bar{\Psi} \tau_i \Psi \left\{ \begin{array}{l} \frac{1}{2} \text{ PPPP} \\ \text{NNNN} \\ 1 \text{ PPNN} \\ \hline \bar{P}P + \bar{N}N \\ (\bar{P}P - \bar{N}N) \end{array} \right.$$

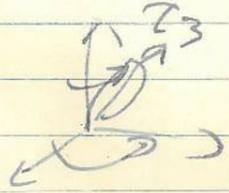
i) space-time inversion

ii) I_1 kinematical charge conserv.

(3)

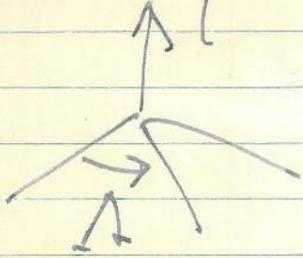
$F_{\mu\nu}$

τ, η



$$F_{12} = \tau + \eta$$

$\tau = \eta$



Fermion $Q = \tau + \frac{1}{2}$

$$\psi \rightarrow e^{i m \alpha} \psi$$

$$A_\mu = \partial_\mu + \partial_\mu \Lambda$$

$$a_\mu \rightarrow a_\mu$$

$$\Lambda \rightarrow \Lambda + \alpha$$