Research Institute for Fundamental Physics
Kyoto University

第5回 討論会

Oct. 27, 1956

(1)

1. 湯川:
2. [illegible]

$\mu^2 = \tau^2$

M_{ij} $\begin{pmatrix} 0 & & \\ & \omega_{-1} & \\ & & 0 \end{pmatrix}$

is origin

3. 総論:
イ. model　　$L \times \Omega$
ロ. im Kleinen
ハ. im großen

4. selection rule, charge formula, mass 〃

$R_3 \ast$
$R_4 \simeq R_3 + R_3$
$R_3 + \Delta$

$R_3 \ast R_2$
τ　σ

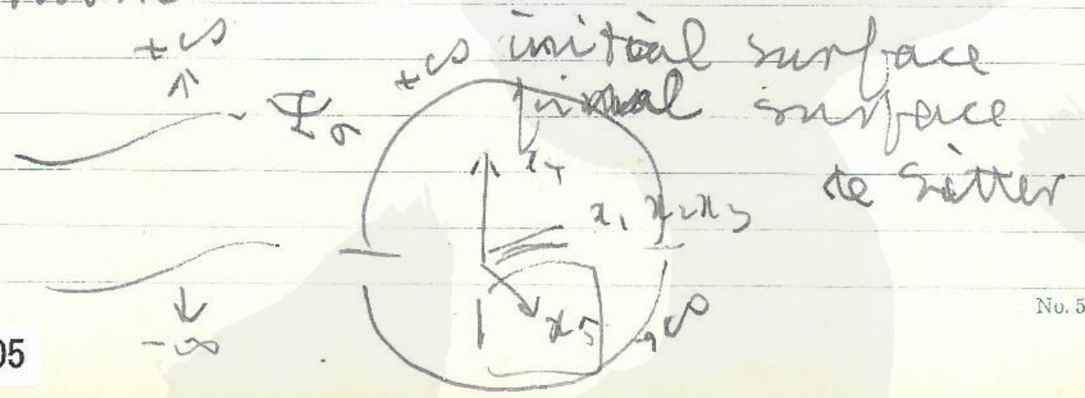
$s = 2\sigma - n$

$M = \kappa^2(s, \tau, \sigma)$

$\kappa^2 = (1 + s(s+1)(\lambda_1' + \lambda_3'\sigma))^2 + \tau(\tau+1)(s(s+1)(\lambda_2' + \lambda_4'\sigma) + 8\sigma)^2$

ロ. $K \to 2\pi$　$a\phi\phi$　$\Gamma^{\lambda}_{\mu\nu} = \frac{1}{2}(L_{\mu\nu}{}^{\lambda} + L_{\nu\mu}{}^{\lambda})$
$K \to 3\pi$　$\phi\phi\phi$　$\Omega^{\lambda}_{\mu\nu} = \frac{1}{2}(\quad - \quad)$
curved
twisted

ハ.



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4. 原・[illegible]井 : charge independence の拡張. III,

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

W.I. では $Q = eI_3$ 　 L 　 $\downarrow$

J_3 　 K_3

$$\mathbb{L} = \mathbb{I} + \mathbb{J} + \mathbb{K}$$

i) L_3
ii) $\mathbb{I} + \mathbb{J}$.
iii) $\mathbb{I}$, $\mathbb{J}$

	I	J
Λ	0	½

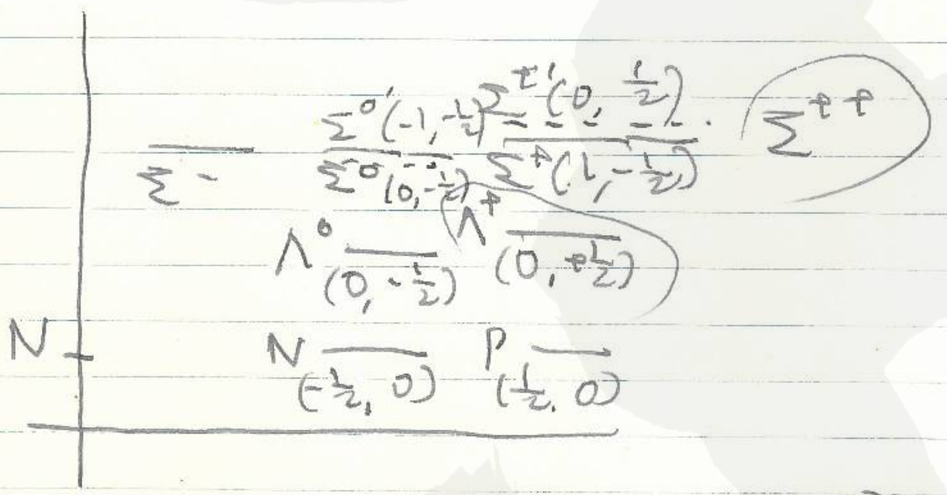
$\Delta I = ½$

i) $\theta^{\pm}$ θ^{0} forbidden

ii) $\frac{\tau(\Sigma^+)}{\tau(\Sigma^-)} \sim 8$ $\searrow$ 1 : 2 　 (cf $\frac{\Sigma^+ \to p + \pi^0}{\Sigma^+ \to N + \pi^+} \sim 1$). $\searrow$ 1 : 4

iii) $\frac{\theta^0 \to 2\pi^0}{\theta^{\pm} \to \pi^{\pm} + \pi^0}$

iv) Λ^0 　 ?



γ-decay : $\Delta I = \pm 1, 0$ 　 $\Delta I_3 = 0$
　　　　　　 J 　　　　　　 J_3

Composite particle
$N : \bar{\Lambda}$
$\Lambda : \cdot\cdot$

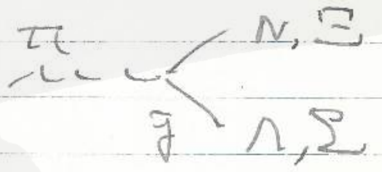
村井：緩和互作用

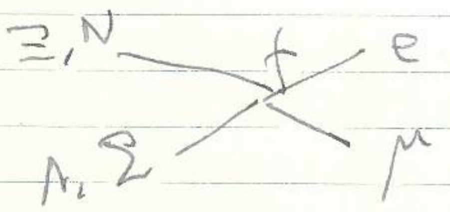
π	D_1^-	$+$	0	D_0
K	$D_{1/2}^{+}$	i	$1/2$	$D_{1/2}$
N	$D_{1/2}$	i	$1/2$	$D_{1/2}$
Λ	D_0^-	$+$	0	D_0
Σ	D_1	$+$	0	D_0
Ξ	$D_{1/2}$	$-i$	$-1/2$	$D_{1/2}$

Fermi interaction

$\mu^\pm$ μ^0 D_1^+
$e^\pm$ ν D_1^-

Yukawa int.





$\pi \to \mu^+ + \mu^0$
$K \to \mu^+ + \nu$
$\qquad e^+ + \mu^0$

結ω：素粒子間の相互作用.

Oj: $M^{(a)}_\alpha, M^{(b)}_\alpha, M^{(c)}_\alpha$　　$\alpha = 1, 2, 3$

$Q = L_3$ integer

$L_\alpha = M^{(a)}_\alpha + M^{(b)}_\alpha + M^{(c)}_\alpha$

$M^{(a)}$	$M^{(b)}$	$M^{(c)}$	B	M	
$\frac{1}{2}$	0	$\frac{1}{2}$	U	K	I
$\frac{1}{2}$	$\frac{1}{2}$	0	Ω	π	II,

S.I.: $M^{(a)}_\alpha + M^{(b)}_\alpha = I_\alpha$

W.I.: $M^{(a)}_\alpha + M^{(c)}_\alpha = I'_\alpha$

$M^{(a)} + M^{(b)} = I$,　$M^{(c)} = K$

	I	K
U K	½	½
Ω π	0, 1	0

Y(S)

UUπ, ΩUK, ...

UΩ~~K~~π, ...

$\Delta I_3 = \pm 1/2$

$\underline{Y = 2K_3}$　　c.c.

U —— Ξ, N

K —— K, $\bar{K}$

Ω —— Σ, Λ

π —— π', π

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$$\alpha = \{ e^{i\varphi L_3},\ S = e^{i\pi L_2} \mid 0 \le \varphi < 2\pi \}$$

$\alpha = L_3$ $\quad 1 \quad -1 \quad 0^+,\ 0^-$

$\alpha_0^+ \quad \alpha_0^- \quad \alpha_1$

$\nu_1 \quad \nu_2 \quad \begin{pmatrix} \mu^+ \\ \mu^- \end{pmatrix} \begin{pmatrix} e^+ \\ e^- \end{pmatrix}$

[illegible] $\nu = \nu_1 + i\nu_2$
[illegible]
[illegible]： [illegible]