Research Institute for Fundamental Physics
Kyoto University

非線型グループ雑談会.　　Feb. 18, 1959

1. 変換性に対する新たな可能性

a. 非線型の変換性

$$v' = \frac{v+u}{1+uv} \quad \rightarrow \quad \tau' = \frac{a\tau+b}{c\tau+d}$$

$$v = p/E \qquad \left.\begin{array}{l} p' = ap + bE \\ E' = cp + dE \end{array}\right\}$$

$$v' = p'/E' = \frac{av+b}{cv+d}$$

$$\left.\begin{array}{ll} a = 1 & b = u \\ c = 1/u & d = 1 \end{array}\right\} \quad \left\| \begin{array}{cc} a & b \\ c & d \end{array} \right\| = 0$$

b. 座標変換と場の量の成分の変換とが結合している場合.

$$\left.\begin{array}{l} \psi_j(x_\mu^{(j)}) \rightarrow \psi'_j(x_\mu^{(j)\prime}) = b_{jk}\psi_k(x_\mu^{(j)}) \\ \quad x_\mu^{(j)\prime} = a_{\mu\nu}^{jk}\, x_\nu^{(k)} \end{array}\right\}$$

$$\left.\begin{array}{l} \mu, \nu = 1, 2, 3, 4 \\ j, k = 1, 2, \ldots n \end{array}\right\}$$

一種の非局所性.　粒子の構造.

2. Causality と時空の量子化

$$\frac{\partial u}{\partial t} = f\left(u, \frac{\partial u}{\partial x}\right)$$

3. 量子化の意味.

a. correlation (Fujiwara)

$$K(x\,t, x''t'') = \int K(x\,t, x't')\,dx'\,K(x't', x''t'')$$

$$S \sim h \; (?)$$

b. discrimination (wave-like picture)

versus dynamical ~~variable~~ quantities (particle-like picture, energy-momentum vector etc.)

c. dynamical laws v. supplem. conditions

$$A\Psi = 0 \quad \rightarrow \quad (\Psi, A\Psi) = 0$$

(Dirac)

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