Wave Geometry.[1]
(Geometry in Microscopic Space.)

By

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§ 1. Introduction.

According to Prof. Mimura,[2] we define the expression for the metric in the general microscopic space by

$$ds\psi = \gamma_i dx^i \psi \tag{1.1}$$

where γ's are 4–4 matrices satisfying the equation

$$\gamma_{(i}\gamma_{j)} = g_{ij} I$$

and ψ is a 1–4 matrix given as a solution of the "*unknown Dirac equation*"—this equation will be obtained in § 5.

According to W. Pauli,[3] the most general expression for γ_i can be expressed as

$$\gamma_i = U h_i^{\varepsilon} \overset{\circ}{\gamma}_{\varepsilon} U^{-1} \tag{1.2}$$

where U is any 4–4 matrix, h_i^{ε} can be any functions and $\overset{\circ}{\gamma}_{\lambda}$ the Dirac matrices.[4] Hereafter we assume that Latin suffices vary 1–4 and Greek suffices 1–5.

For the sake of brevity in the subsequent calculation and also bearing in mind certain future applications to projective relativity, we introduce γ_5 such that

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(3) Ann. d. Phys. **18** (1933), 337.

(4) $\overset{\circ}{\gamma}_1 = \begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$, $\overset{\circ}{\gamma}_2 = \begin{pmatrix} 0 & 0 & 0 & -i \\ 0 & 0 & -i & 0 \\ 0 & i & 0 & 0 \\ i & 0 & 0 & 0 \end{pmatrix}$, $\overset{\circ}{\gamma}_3 = \begin{pmatrix} 0 & 0 & 0 & 1 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$,

$\overset{\circ}{\gamma}_4 = \begin{pmatrix} 0 & 0 & -i & 0 \\ 0 & 0 & 0 & i \\ i & 0 & 0 & 0 \\ 0 & -i & 0 & 0 \end{pmatrix}$, $\overset{\circ}{\gamma}_5 = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & -1 \end{pmatrix}$,