

Uniqueness Theorems in the Unified Theory of Relativity

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I. Introduction.

(1) Denote by X_n an n -dimensional space ($n > 1$). Let $g_{\lambda\mu}$ be a given *real* tensor in X_n having

$$(1.1) \quad h_{\lambda\mu} = g_{(\lambda\mu)}, \quad k_{\lambda\mu} = g_{[\lambda\mu]},$$

as its symmetric and skew-symmetric parts, respectively. Moreover, introduce the notation

$$(1.2a) \quad g \equiv \det ((g_{\lambda\mu})), \quad h \equiv \det ((h_{\lambda\mu})), \quad k \equiv \det ((k_{\lambda\mu})).$$

Throughout this paper we assume

$$(1.3a) \quad h \neq 0,$$

so that the scalars

$$(1.2b) \quad G = g/h, \quad K = k/h,$$

are not meaningless.

We consider $h_{\lambda\mu}$ as a metric tensor in X_n , and denote its Christoffel symbols by $\left\{ \begin{smallmatrix} \nu \\ \lambda\mu \end{smallmatrix} \right\}$, and the covariant derivatives based on $\left\{ \begin{smallmatrix} \nu \\ \lambda\mu \end{smallmatrix} \right\}$ by ∇_μ . Lowering and raising of indices are performed by $h_{\lambda\mu}$ and $h^{\rho\sigma}$, respectively.

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