

tangency

$T_x M = \mathbb{R}$ -module

$M =$ microlinear type

$x \in M$

$T_x M$ x における.

$\{t: D \rightarrow \parallel M \parallel_0 \mid t(0) = |x|_0\}$

Vector field 3つの視点が本質的には equivalent

$\pi: M^D \rightleftarrows M$
 $\pi(t) = t(0)$

projection

M の各点における
基点 x

$X(x) \in M^D$ $(M^D)^M = M^{D \times M} = (M^M)^D$
 $\pi(X(x)) = x$

$X: D \times M \rightarrow M$

$X(0, x) = x$

$X_0 = \text{id}_M$

$X: D \rightarrow (M^M)$ 関数空間

$X_0 = \text{id}_M$ 接空間

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$\lambda x \in M \quad T_x M$

fibration

(1) the type of sections

$\prod_{x \in M} T_x M$

(2) the type of infinitesimal flows on $\parallel M \parallel_0$

$f: D \times \parallel M \parallel_0 \rightarrow \parallel M \parallel_0$ with $\prod_{x \in \parallel M \parallel_0} f(0, x) = x$

(3) the type of infinitesimal transformations of $\parallel M \parallel_0$

mappings

$X: D \rightarrow \parallel M \parallel_0 \rightarrow \parallel M \parallel_0$
with $X_0 = \text{id}_{\parallel M \parallel_0}$

naturally equivalent

proof section of $\lambda_{x=M} T_x M$

$$\tilde{F} = M \rightarrow D \rightarrow \|M\|_0 \quad \text{with } \pi_{x=M} \tilde{F}(x, 0) = |x|_0$$

$$\hat{F} = D \rightarrow M \rightarrow \|M\|_0 \quad \text{with } \pi_{x=M} \hat{F}(0, x) = |x|_0$$

$$\underline{M \rightarrow \|M\|_0 \cong \mathbb{R} \|M\|_0 \rightarrow \|M\|_0}$$

$$f = D \rightarrow \|M\|_0 \rightarrow \|M\|_0 \quad \text{with } \pi_{x=\|M\|_0} f(0, x) = x$$