Prolongation of Linear Semibasic Tangent Valued Forms to Product Preserving Gauge Bundles of Vector Bundles

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Abstract

Let $A$ be a Weil algebra and $V$ be an $A$-module with $\dim_{\mathbb{R}} V < \infty$. Let $E \to M$ be a vector bundle and let $T^{A,V}E \to T^{A}M$ be the vector bundle corresponding to $(A,V)$. We construct canonically a linear semibasic tangent valued $p$-form $T^{A,V}\varphi : T^{A,V}E \to \wedge^p T^*M \otimes T^{A}M \wedge T^{A,V}E$ on $T^{A,V}E \to T^{A}M$ from a linear semibasic tangent valued $p$-form $\varphi : E \to \wedge^p T^*M \otimes TE$ on $E \to M$. For the Frolicher-Nijenhuis bracket we prove that $[[T^{A,V}\varphi, T^{A,V}\psi]] = T^{A,V}([[\varphi, \psi]])$ for any linear semibasic tangent valued $p$- and $q$- forms $\varphi$ and $\psi$ on $E \to M$. We apply these results to linear general connections on $E \to M$.

Key words: Weil algebra, Weil module, bundle functor corresponding to Weil module, linear semibasic tangent valued form, Frolicher-Nijenhuis bracket, natural operator, linear general connection, curvature of linear general connection.

References


273
