Shurygin, Vadim V.; **Smolyakova, Larisa B.**

An analog of the Vaisman-Molino cohomology for manifolds modelled on some types of modules over Weil algebras and its application. (English) Zbl 0995.58001

Lobachevskii J. Math. 9, 55-75 (2001).

An epimorphism $\mu : \mathbf{A} \to \mathbf{B}$ of local Weil algebras induces the functor T^μ from the category of fibered manifolds to itself which assigns to a fibred manifold $P : M \to N$ the fibred product $p^\mu : T^{\mathbf{A}}N \times_{T^{\mathbf{B}}N} T^{\mathbf{B}}M \to T^{\mathbf{A}}N$.

The authors show that the manifold $T^{\mathbf{A}}N \times_{T^{\mathbf{B}}N} T^{\mathbf{B}}M$ can be endowed with a canonical structure of an $\mathbf{A}$-smooth manifold modeled on the $\mathbf{A}$-module $\mathbf{L} = \mathbf{A}^n \oplus \mathbf{B}^m$, $n = \dim N$, $n + m = \dim M$. The functor T^μ is extended to the category of foliated manifolds. $\mathbf{A}$-smooth manifolds $M^{\mathbf{L}}$ whose foliated structure is locally equivalent to that of $T^{\mathbf{A}}N \times_{T^{\mathbf{B}}N} T^{\mathbf{B}}M$ are studied. For manifolds $M^{\mathbf{L}}$ bigraduated cohomology groups are constructed. The obstructions for existence of an $\mathbf{A}$-smooth linear connection on $M^{\mathbf{L}}$ are described in terms of the introduced cohomology groups.

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