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Cohomology of \mathbb{N} -Graded Lie Algebras of Maximal Class over \mathbb{Z}_2

We compute the cohomology with trivial coefficients of Lie algebras \mathfrak{m}_0 and \mathfrak{m}_2 of maximal class over the field \mathbb{Z}_2 . In the infinite-dimensional case, we show that the cohomology rings $H^*(\mathfrak{m}_0)$ and $H^*(\mathfrak{m}_2)$ are isomorphic, in contrast to the case of the ground field of characteristic zero, and we obtain a complete description of them. In the finite-dimensional case, we find the first three Betti numbers of $\mathfrak{m}_0(n)$ and $\mathfrak{m}_2(n)$ over \mathbb{Z}_2 .

Keywords: Lie algebra of maximal class, characteristic 2, cohomology, Betti number.

MSC: 17B56, 17B50, 17B70, 17B65, 17B30