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Cohomology of the Lie Algebra of Vector Fields on Some One-dimensional Orbifold

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I. M. Gelfand and D. B. Fuchs have proved that the cohomology algebra of the Lie algebra of vector fields on the unit circle is isomorphic to the tensor product of the polynomial ring with one generator of degree two and the exterior algebra with one generator of degree three. In the present paper the cohomology of the Lie algebra of vector fields on the one-dimensional orbifold $S^1/\mathbb{Z}_2$ are studied. $S^1/\mathbb{Z}_2$ is the orbit space under the $\mathbb{Z}_2$ group action on the unit circle by reflection in the Ox axis. It has been proved that the cohomology algebra of the Lie algebra of vector fields on the orbifold is isomorphic to the tensor product of the exterior algebra with two generators of degree one and the polynomial ring with one generator of degree two. To prove this result author used the Gelfand–Fuchs method with some modifications.

Key words: orbifold, Lie algebra, cohomology.

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