Central Extension, Derivations and Automorphism Group for Lie Algebras Arising from the 2-Dimensional Torus

Let $A = \mathbb{C}[x_1^{\pm 1}, x_2^{\pm 1}]$ be the ring of Laurent polynomials and $B$ the set of skew derivations of $A$. Set $\tilde{L} = A \oplus B$. In this paper, we study the automorphism group, derivations and universal central extension of the derived Lie subalgebra of $\tilde{L}$.

Keywords: Virasoro algebra, central extension, automorphism group.

MSC: 17B05, 17B68