

# AUTOMORPHISMS OF SIMPLE QUOTIENTS OF THE POISSON AND UNIVERSAL ENVELOPING ALGEBRAS OF $\mathfrak{sl}_2$

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## Abstract

Let  $P(\mathfrak{sl}_2(K))$  be the Poisson enveloping algebra of the Lie algebra  $\mathfrak{sl}_2(K)$  over an algebraically closed field  $K$  of characteristic zero. U. Umirbaev, V. Zhelyabin proved that the quotient algebras  $P(\mathfrak{sl}_2(K))/(C_P - \lambda)$ , where  $C_P$  is the standard Casimir element of  $\mathfrak{sl}_2(K)$  in  $P(\mathfrak{sl}_2(K))$  and  $0 \neq \lambda \in K$ , are simple. Using a result by L. Makar-Limanov on groups of automorphisms of a class of surfaces, we describe generators of the automorphism group of  $P(\mathfrak{sl}_2(K))/(C_P - \lambda)$  and represent this group as an amalgamated product of its subgroups. Moreover, using similar results by J. Dixmier and O. Fleury for the quotient algebras  $U(\mathfrak{sl}_2(K))/(C_U - \lambda)$ , where  $C_U$  is the standard Casimir element of  $\mathfrak{sl}_2(K)$  in the universal enveloping algebra  $U(\mathfrak{sl}_2(K))$ , we prove that the automorphism groups of  $P(\mathfrak{sl}_2(K))/(C_P - \lambda)$  and  $U(\mathfrak{sl}_2(K))/(C_U - \lambda)$  are isomorphic.

This is a joint work with professor U. Umirbaev.