

COMMUTATIVE AND NONCOMMUTATIVE CLASSICAL INVARIANT THEORY

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One of the most intensively studied objects in classical invariant theory is the algebra of invariants of the special linear group $SL_2(\mathbb{C})$ acting on binary forms. We survey some of the classical results in this direction. Then we consider their noncommutative analogues when the group $SL_2(\mathbb{C})$ acts on free and relatively free associative and Lie algebras. We discuss the main problems: (non)finite generation, explicit sets of generators and Hilbert series of the algebra of invariants.

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