Infinitesimal Invariants in a Function Algebra

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Abstract. Let $G$ be a reductive connected linear algebraic group over an algebraically closed field of positive characteristic and let $\mathfrak{g}$ be its Lie algebra. First we extend a well-known result about the Picard group of a semi-simple group to reductive groups. Then we prove that if the derived group is simply connected and $\mathfrak{g}$ satisfies a mild condition, the algebra $K[G]^\circ$ of regular functions on $G$ that are invariant under the action of $\mathfrak{g}$ derived from the conjugation action is a unique factorisation domain.

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