Let $g_i$ be a simple complex Lie algebra, $1 \leq i \leq d$, and let $G = G_1 \times \cdots \times G_d$ be the corresponding adjoint group. Consider the $G$-module $V = \oplus r_i g_i$, where $r_i \in \mathbb{N}$ for all $i$. We say that $V$ is large if all $r_i \geq 2$ and $r_i \geq 3$ if $G_i$ has rank 1. In “Quotients, automorphisms and differential operators”, http://arxiv.org/abs/1201.6369 (2012), we showed that when $V$ is large any algebraic automorphism $\psi$ of the quotient $Z := V//G$ lifts to an algebraic mapping $\Psi: V \rightarrow V$ which sends the fiber over $z$ to the fiber over $\psi(z), z \in Z$. (Most cases were already handled in J. Kuttler, Lifting automorphisms of generalized adjoint quotients, Transformation Groups 16 (2011) 1115–1135.) We also showed that one can choose a biholomorphic lift $\Psi$ such that $\Psi(gv) = \sigma(g)\Psi(v), g \in G, v \in V$, where $\sigma$ is an automorphism of $G$. This leaves open the following questions: Can one lift holomorphic automorphisms of $Z$? Which automorphisms lift if $V$ is not large? We answer the first question in the affirmative and also answer the second question. Part of the proof involves establishing the following result for $V$ large: Any algebraic differential operator of order $k$ on $Z$ lifts to a $G$-invariant algebraic differential operator of order $k$ on $V$. We also consider the analogues of the questions above for actions of compact Lie groups.

**Keywords**: Differential operators, automorphisms, quotients, adjoint representation.

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