Semigroup Actions on Adjoint Orbits

Let $G$ be a connected semi-simple Lie group with finite center and $S \subset G$ a subsemigroup with $\text{int}\ S \neq \emptyset$. In this article we study the control sets for the actions of $S$ on the adjoint orbits $\text{Ad}(G)H$, where $H$ is a regular element in the Lie algebra of $G$. We show here that these sets can be described as sets of fixed points for regular elements in the interior of $S$. Moreover, we shall describe the domains of attraction of this control sets and show that these sets are not comparable with respect to the natural order on control sets.

Keywords: Semigroup, adjoint orbits, regular elements.

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