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Invariant Control Sets on Flag Manifolds and Ideal Boundaries of Symmetric Spaces

Let G be a semisimple real Lie group of non-compact type, K a maximal compact subgroup and $S \subseteq G$ a semigroup with nonempty interior. We consider the ideal boundary $\partial_\infty(G/K)$ of the associated symmetric space and the flag manifolds G/P_Θ. We prove that the asymptotic image $\partial_\infty(Sx_0) \subseteq \partial_\infty(G/K)$, where $x_0 \in G/K$ is any given point, is the maximal invariant control set of S in $\partial_\infty(G/K)$. Moreover there is a surjective projection

$$\pi \colon \partial_\infty(Sx_0) \to \bigcup_{\Theta \subseteq \Sigma} C_\Theta,$$

where C_Θ is the maximal invariant control set for the action of S in the flag manifold G/P_Θ, with P_Θ a parabolic subgroup. The points that project over C_Θ are exactly the points of type Θ in $\partial_\infty(Sx_0)$ (in the sense of the type of a cell in a Tits Building).

Keywords: Semigroups, semi-simple Lie groups, control sets, ideal boundary.

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