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Controllability of right-invariant systems on solvable Lie groups

A right-invariant control system $\dot{x} = A(x) + \sum_{i=1}^{m} u_i B_i(x)$ on a Lie group G is called controllable if any two points in the group G can be connected by a trajectory of the system. We are interested in conditions of controllability of such systems in terms of the Lie group G, its Lie algebra L, and the right-invariant vector fields $A, B_1, \ldots, B_m \in L$. For simply connected Lie groups $G \neq [G,G]$ we give necessary and sufficient controllability conditions close one to another. For $\dim G \leq 6$ almost complete classification of controllable single-input ($m = 1$) systems is given.

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