

High-order Hamiltonians for small time controllability of manifolds

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In the classical problem of small time local controllability, we will discuss a new approach to sufficient conditions for the attainability of smooth manifolds of any dimension, possibly with an edge. We will discuss explicit point conditions of any order by using higher order hamiltonians which combine derivatives of the controlled vector field and the functions that locally define the target. When the target is a point, our sufficient conditions extend some classical results stated for symmetric or affine control systems, using the Lie algebra instead. Our sufficient higher order conditions are explicit and easy to compute for targets with curvature and general nonlinear systems.