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Normal singular orbits with minimal rank of a real-analytic D-Hamiltonian

It is known that the intersection of singular with normal geodesics of a sub-Riemannian manifold might not be empty. In this talk, we demonstrate that, after a generic conformal perturbation of the metric g, all singular curves of a real-analytic sub-Riemannian manifold (M,D,g) become strictly abnormal —assuming D a totally non-holonomic distribution of co-rank 1. Our proof relies on techniques of Hamiltonian dynamics and differential geometry.

We obtain the mentioned claim as a corollary of a more general statement about real analytic D-Hamiltonians (a quadratic D-Hamiltonian is nothing but a sub-Riemannian Hamiltonian). Given a real-analytic D-Hamiltonian H, we will show if (Q,P) is an orbit of H+u, where u is a generic real-analytic potential, then Q is not a D-singular curve with minimal rank.