HAMILTONIAN SYSTEMS AND OPTIMAL CONTROL STRONG MAXIMUM PRINCIPLE

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Abstact.

My lecture will focus on the contributions of geometric control theory to the calculus of variations and on their effect on geometry and mechanics. There will be two main focal points: first, Lie theory and its relation to the accessibility properties of the reachable sets, and second, The Maximum Principle and the boundaries of the reachable sets. The significance of these topological properties is then discussed in relation to the classical theory of the calculus of variations.

We will present a strong version of the Maximum Principle that includes the symmetries of the system and show how Nœthers Theorem and the related Moment Map follow from this general principle. The lecture will end with the applications to systems on Lie groups with left-invariant symmetries, coadjoint orbits and integrable Hamiltonian systems.

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