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Equivariant formality beyond Hamiltonian actions

It is well known that Hamiltonian torus actions on compact symplectic manifolds are equivariantly formal; particular cases include coadjoint orbits and generalized flag manifolds G/K . Less is known in the case of the isotropy action of a Lie group K on a homogeneous space G/K when K is not of full rank in G .

In this talk I will explain the known cases and characterizations of equivariant formality of such actions in terms of ordinary cohomology, rational homotopy theory, invariant theory, and equivariant K-theory. We will also state a structure theorem for the equivariant cohomology and rationalized K-theory of such equivariantly formal actions.

Some of this work is joint with Chi-Kwong Fok.