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The equivariant K-theory of a cohomogeneity-one action

We compute the equivariant K-theory ring of a cohomogeneity-one action of a compact, connected Lie group on a smooth manifold. This being by definition the case when the orbit space is one-dimensional, it can be seen as a natural next case after that of a transitive action.

Concrete expressions analogous to the cohomological case (due to the speaker, Goertsches, He, and Mare) only arise in the case when the fundamental group of a stabilizer is free abelian. The computation of the additive structure is mainly representation theory and Lie theory, and the multiplicative structure, surprisingly, follows from the Mayer–Vietoris sequence.