COMPACT GROUP ACTIONS AND
MANIFOLDS ON WHICH ONLY TORI CAN ACT

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The purpose of this thesis is to study rational K-manifolds and admissible manifolds, on which only tori can act.

In chapter I, we state some remarks which will be generalized in following chapters.

In chapter II, we obtain the first of our main theorems about the injectiveness of a group action on a rational K-manifold. Using this information, we are able to see that only tori can act effectively on rational K-manifolds. Next we describe a sufficient condition that any torus action on a rational K-manifold is homologically injective. These results are generalizations of Gottlieb–Lee–Ozaydin's work.

In chapter III, we are interested in an admissible manifold which is a generalized concept of that of K-manifold. First we proved that two of Gottlieb–Lee–Ozaydin's results for K-manifold also hold in an admissible manifold case. Next by defining a new normal subgroup $N(G)$ of a finite group G acting effectively on a closed connected manifold, we give a characterization of an admissible manifold and reproved that only tori can act effectively on admissible manifolds.

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