

LS-CATEGORY AND TOPOLOGICAL COMPLEXITY OF MILNOR MANIFOLDS AND CORRESPONDING GENERALIZED PROJECTIVE PRODUCT SPACES

NAVNATH DAUNDKAR

ABSTRACT. Milnor manifolds are a class of certain codimension-1 submanifolds of the product of projective spaces. In this paper, we study the LS-category and topological complexity of these manifolds. We determine the exact value of the LS-category and, in many cases, the topological complexity of these manifolds. We also obtain tight bounds on the topological complexity of these manifolds. It is known that Milnor manifolds admit \mathbb{Z}_2 and circle actions. We compute bounds on the equivariant LS-category and equivariant topological complexity of these manifolds. Finally, we describe the mod-2 cohomology rings of some generalized projective product spaces corresponding to Milnor manifolds and use this information to compute the bound on LS-category and topological complexity of these spaces.

1. Introduction

Farber [10] introduced the notion of topological complexity to study the robot motion planning problem from a topological perspective. For a topological space X , this numerical homotopy invariant is denoted as $TC(X)$. Let X be a path connected space and PX be the space of all paths in X equipped with a compact open topology. Let $\gamma: [0, 1] \rightarrow X$ be any path in X . Then there

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