Gugnin, D. V.
On nonfree actions of commuting involutions on manifolds. (English. Russian original)

Summary: A new lower bound is obtained relating the rational cup-length of the base and that of the total space of branched coverings of orientable manifolds for the case in which the branched covering is a projection onto the quotient space by the action of commuting involutions on the total space. This bound is much stronger than the classical Berstein-Edmonds 1978 bound which holds for arbitrary branched coverings of orientable manifolds. In the framework of the theory of branched coverings, results are obtained that are motivated by the problems concerning $n$-valued topological groups. We explicitly construct $m - 1$ commuting involutions acting as automorphisms on the torus $T^m$ with the orbit space $\mathbb{RP}^m$ for any odd $m \geq 3$. By the construction thus obtained, the manifold $\mathbb{RP}^m$ carries the structure of an $2^{m-1}$-valued Abelian topological group for all odd $m \geq 3$.

MSC:
57M12 Low-dimensional topology of special (e.g., branched) coverings
57S17 Finite transformation groups
55M30 Lusternik-Shnirel’man category of a space, topological complexity à la Farber, topological robotics (topological aspects)
55M35 Finite groups of transformations in algebraic topology (including Smith theory)
20Nxx Other generalizations of groups
05Exx Algebraic combinatorics

Keywords:
finite transformation group; cup-length; branched covering of manifold; $n$-valued group

Full Text: DOI

References:

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