ON THE COHOMOLOGICAL RIGIDITY OF QUASITORIC MANIFOLDS

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Let P be a simple n-polytope, and T^n be the n-dimensional torus $(S^1)^n$. A quasitoric manifold over P is a $2n$-dimensional manifold M with a locally standard T^n-action, namely, an action locally modeled in the diagonal action of T^n on $\mathbb{C}^n$, for which the orbit space M/T^n is homeomorphic to P as a manifold with corners.

A class $\mathcal{C}$ of topological spaces is called cohomologically rigid if it satisfies the following condition: for any $X, Y \in \mathcal{C}$, they are homeomorphic if $H^*(X;\mathbb{Z})$ and $H^*(Y;\mathbb{Z})$ are isomorphic as graded rings. The cohomological rigidity problem for $\mathcal{C}$ asks whether the class $\mathcal{C}$ is cohomologically rigid or not.

On the cohomological rigidity of quasitoric manifolds, it is known that the class of quasitoric manifolds with the second Betti number ≤ 2 is cohomologically rigid ([CPS12]). I will talk about quasitoric manifolds over the dual cyclic polytopes and the 3-dimensional cube. The cohomological rigidity again holds for these quasitoric manifolds.

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