

Milnor-Thurston homology of some wild topological spaces

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Milnor-Thurston homology theory is a version of homology theory admitting chains with infinite number of singular simplices. The other well known name for this theory is “measure homology”, since it exploits techniques from measure theory.

This theory was first defined in the context of hyperbolic geometry, where it was used to provide a new proof of the Mostow Rigidity Theorem [3, Chapter 6]. The behaviour of Milnor-Thurston homology theory is well known in the case of CW-complexes, since it satisfies the Eilenberg-Steenrod Axioms. The case of more general spaces is mostly unexplored. The first results in that direction were obtained by Zastrow [4, Section 6]. And the first concrete computation of Milnor-Thurston homology groups was obtained by Przewocki [1].

The aim of this talk is to present results of the preprint [2]. We show that there is a coincidence of zeroth homology groups for Peano Continua (this does not follow from the Eilenberg-Steenrod Axioms, since Peano Continua are not triangulable in general). We prove that under some condition the canonical homomorphism from singular homology to Milnor-Thurston homology is a monomorphism, and we present a counterexample showing that this condition cannot be omitted.

References

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- [3] W. P. Thurston, *Geometry and Topology of Three-manifolds*, Lecture notes, available at <http://www.msri.org/publications/books/gt3m>, Princeton, 1978
- [4] A. Zastrow, *On the (non)-coincidence of Milnor-Thurston homology theory with singular homology theory*, *Pacific Journal of Mathematics* Vol. 186(1998), No. 2, 369–396