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The Non-Hausdorffness of Milnor-Thurston-Homology groups

Abstract. Milnor-Thurston Homology-Theory (also called "measure-homology-theory") apparently appared for the first time in Thurston's lecture notes on three-manifolds (who also credited Milnor for it), appeared for the first time in peer-reviewed literature in Gromov's work on bounded cohomology, and for the first time in a text-book in Ratcliffe's book on hyperbolic manifolds. The basic idea is that via certain measures that can be put on the set of all singular simplices, infinite chains in homology theory can be described that should generate the ordinary singular homology groups. The main application of this theory (so far) has been that it does allow a more symmetric approximation of the fundamental cycle of a hyperbolic manifold than can be achieved by classical singular homology theory. Some papers appeared since which discussed the well-definedness of this homology-theory, whether it always generates isomorphic groups as singular theory, ('yes' for triangulable spaces, but 'no' in general), and whether in case we have isomorphisms they are isometries with respect to the Gromov-Norm. Recently a paper by Berlanga appeared which topologized these homology groups and proved that for triangulable spaces the first homology groups are always Hausdorff. The talk will be about to answer in negative the question from this paper, whether this also holds in general, i.e. also for non-triangulable spaces.