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Title: \mathbb{Z} -Groups Acting on $\text{CAT}(0)$ Cube Complexes

Description:

An \mathbb{Z} -group is a group which admits a lattice ordering where multiplication on the left and right act as lattice automorphisms. We exhibit that for a certain subclass of \mathbb{Z} -groups there are $\text{CAT}(0)$ cube complexes on which the groups act properly discontinuously. The complex arises from Sageev's halfspace construction [\cite{Sag95}](#) when considering halfspaces to be prime ideals and prime filters of the \mathbb{Z} -group. We examine the structure of the space in relation to the lattice and also when the action is cocompact, leading to a biautomatic structure on the \mathbb{Z} -group [\cite{NR98}](#).

[\bibitem{NR98}](#) G.~A.~ Niblo and L.~D. Reeves. The geometry of cube complexes and the complexity of their fundamental groups. *{\em Topology}*, 37(3):621-633, 1998.

[\bibitem{Sag95}](#) Michah Sageev. Ends of group pairs and non-positively curved cube complexes. *{\em Proc. London Math. Soc. (3)}*, 71(3):585-617, 1995.