

# Nonrealizable equivariant chain complexes

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Carlsson conjectured that if a finite CW complex admits a free action by an elementary abelian  $p$ -group  $G$  of rank  $n$ , then the sum of its mod- $p$  Betti numbers is at least  $2^n$ . In 2017, Iyengar and Walker constructed equivariant chain complexes that are counterexamples to an algebraic version of Carlsson's conjecture. This raised the question if these chain complexes can be realized topologically by free  $G$ -spaces to produce counterexamples to Carlsson's conjecture.

In this talk, I will explain that this is not possible, based on multiplicative properties of the spectral sequence obtained by filtration with powers of the augmentation ideal.