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On free actions by elementary abelian p -groups

Carlsson conjectured that if a finite complex admits a free action by an elementary abelian p -group of rank n , then the sum of its mod- p Betti numbers is at least 2^n . For the prime $p = 2$, he reduced the conjecture to an algebraic problem which he solved for low n . In this talk, I will report on joint work in progress with Jeremiah Heller with the goal of extending Carlsson's methods to all primes. The crucial ingredient is a new notion of Koszul p -complexes.