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A FINITELY GENERATED GROUP THAT DOES NOT SATISFY THE GENERALIZED BURGHELEA CONJECTURE

A. DRANISHNIKOV AND M. HULL

Abstract. We construct a finitely generated group that does not satisfy the generalized Burghelea conjecture.

1. Generalized Burghelea Conjecture

In [2], Burghelea gave an explicit formula for the periodic cyclic homology of groups algebras with rational coefficients (and more generally with coefficients in fields of characteristic zero):

$$PHC_*(\mathbb{Q}G) = \bigoplus_{[x]\in\langle G\rangle^{fin},n\geq 0} H_{2n+*}(N_x,\mathbb{Q}) \oplus \bigoplus_{[x]\in\langle G\rangle^{\infty}} T_*(x;\mathbb{Q})$$

where the group $T_*(x;\mathbb{Q}) = \lim_{\leftarrow}\{H_{*+2n}(N_x,\mathbb{Q})\}$.

Here G_x denotes the centralizer of x in G, $N_x = G_x/\langle x\rangle$ is the reduced centralizer, $\langle G\rangle^{fin}$ is the set of conjugacy classes of elements of finite order, and $\langle G\rangle^{\infty}$ the set of conjugacy classes of elements of infinite order. The bonding maps in the inverse sequences are the Gysin homomorphisms $S : H_{m+2}(N_x,\mathbb{Q}) \to H_m(N_x,\mathbb{Q})$ corresponding to the fibration $B\langle x\rangle \simeq S^1 \to BG_x \to BN_x$.

Conjecture 1.1 (Generalized Burghelea Conjecture)**.** *Let G be a discrete group, then $T_*(x;\mathbb{Q}) = 0$ for all $x \in \langle G\rangle^{\infty}$.*

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