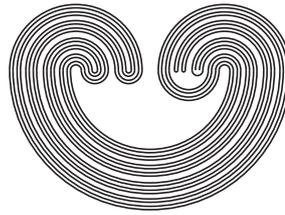


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## A FINITELY GENERATED GROUP THAT DOES NOT SATISFY THE GENERALIZED BURGHELEA CONJECTURE

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

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ABSTRACT. We construct a finitely generated group that does not satisfy the generalized Burghlelea conjecture.

### 1. GENERALIZED BURGHELEA CONJECTURE

In [2], Burghlelea 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  $S : H_{m+2}(N_x, \mathbb{Q}) \rightarrow H_m(N_x, \mathbb{Q})$  corresponding to the fibration  $B\langle x \rangle \simeq S^1 \rightarrow BG_x \rightarrow BN_x$ .

**Conjecture 1.1** (Generalized Burghlelea 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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