Lebel, Alain; **Flannery, D. L.**; **Horadam, K. J.**
Group algebra series and coboundary modules. (English) [Zbl 1201.20003]
J. Pure Appl. Algebra 214, No. 7, 1291-1300 (2010).

The shift action on the 2-cocycle group $Z^2(G, C)$ of a finite group G with coefficients in a finitely generated Abelian group C, introduced by the third author [J. Pure Appl. Algebra 188, No. 1-3, 127-143 (2004; Zbl 1043.20026)], has several useful applications in combinatorics and digital communications, arising from the invariance of a uniform distribution property of cocycles under the action.

In this article, the authors study the shift orbit structure of the coboundary subgroup $B^2(G, C)$ of $Z^2(G, C)$. The study is placed within a well-known setting involving the Loewy and socle series of a group algebra over G. They prove new bounds on the dimensions of terms in such series. Asymptotic results on the size of shift orbits are also derived; for example, if C is an elementary Abelian p-group, then almost all shift orbits in $B^2(G, C)$ are maximal-sized for large enough finite p-groups G of certain classes.

<div align="right">Reviewer: János Kurdics (Nyíregyháza)</div>

MSC:

20C05	Group rings of finite groups and their modules (group-theoretic aspects)
20J06	Cohomology of groups
16S34	Group rings

Cited in **1** Document

Keywords:

group algebras; Loewy series; socle series; cohomology; 2-cocycles; coboundaries; shift actions; modules; finite p-groups

Software:

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