

**Flannery, D. L.**

**Calculation of cocyclic matrices.** (English) Zbl 0867.20043  
J. Pure Appl. Algebra 112, No. 2, 181-190 (1996).

Let  $G$  be a finite group,  $U$  be a  $G$ -module and  $H^2(G, U)$  the second cohomology group of  $G$  with coefficients in  $U$ . Note that a 2-cocycle  $\psi$  is naturally displayed as a cocyclic matrix whose rows and columns are indexed by the elements of  $G$  and whose entry in the position  $(g, h)$  is  $\psi(g, h)$ . The cocyclic matrices with coefficients in  $\mathbb{Z}_2$  are closely related to Hadamard matrices and may consequently provide a new way of generating designs, see *K. J. Horadam* and *W. de Launey* [J. Algebr. Comb. 2, No. 3, 267-290 (1993; Zbl 0785.05019)].

In this paper the author provides a method of explicitly determining cocyclic matrices of representatives for all 2-cocycle classes in  $H^2(G, U)$ , when  $U$  is a finitely generated  $G$ -module trivial under the action of  $G$ . The method is based on the Universal Coefficient Theorem. Also symmetry properties of cocyclic matrices are investigated.

Reviewer: [V.B.Mnukhin \(Taganrog\)](#)

**MSC:**

[20J06](#) Cohomology of groups  
[05B20](#) Combinatorial aspects of matrices (incidence, Hadamard, etc.)

Cited in **1** Review  
Cited in **10** Documents

**Keywords:**

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**References:**

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