chapters. The book also provides an in depth documentation of the authors sparse matrix package "SPARSPAK". The detailed study of the coding of these methods provides an example of good Fortran programming style.

JOSEPH E. PASCIAK

Applied Mathematics Department
Brookhaven National Laboratory
Upton, New York 11973

20[10.05].—V. K. B. KOTA, *Table of Reduction of* $U(10)$ *Partitions into* $SU(3)$ *Irreducible Components*, 112 pages of computer printout, deposited in the UMT file.

The irreducible representations (IR) of the unitary group $U(10)$ corresponding to any integer N, are denoted [1] by the Young partitions $[f]$, where

$$[f] = [f_1 f_2 \cdots f_{10}]$$

with $f_i \geq f_{i+1} \geq 0$, and $\Sigma_{i=1}^{10} f_i = N$ while the IR of $SU(3)$ (the unitary unimodular group in three dimensions) are denoted [2] by the pair of numbers $(\lambda\,\mu)$. The tabulations are for the reduction of the IR of $U(10)$ to IR of $SU(3)$ with the constraint that the partition [1] of $U(10)$ correspond to the IR (3 0) of $SU(3)$. Essentially the problem is to obtain the $SU(3)$ content of the "plethysms" $\{3\} \otimes \{f\}$. All possible $U(10)$ partitions having a maximum of four columns (i.e., all partitions of the type $[4^a 3^b 2^c 1^d]$ are considered and their reductions to $SU(3)$ contents are tabulated. A method to obtain these reductions is given in [3] and a computer code is constructed for the IBM 360/44 machine which follows this procedure step by step. The reductions for $N \leq 6$ are given previously by Ibrahim [4]. The tabulations give the reductions up to $N = 20$, and for the remaining partitions the reductions can be obtained using the relationship

$$[4^{10-a-b-c-d} 3^d 2^c 1^b] = \sum_\gamma A_\gamma(\mu_\gamma \lambda_\gamma),$$

if

$$[4^a 3^b 2^c 1^d] = \sum_\gamma A_\gamma(\lambda_\gamma \mu_\gamma),$$

where A_γ gives the number of occurrences of $(\lambda_\gamma \mu_\gamma)$ in the reduction of the partition $[4^a 3^b 2^c 1^d]$. The stringent dimensionality check is performed for each partition and the tabulations display all types of symmetry checks.

In the tables, the $U(10)$ partition was printed out as $f_1 f_2 f_3 \cdots f_{10}$ and below this the IR of $SU(3)$ contained in the partition are all listed as $A_1(\lambda_1 \mu_1) A_2(\lambda_2 \mu_2)\ldots.$

AUTHOR'S SUMMARY

Physical Research Laboratory
Navarangpura
Ahmedabad 380 009, India

1. H. HAMERMESH, *Group Theory and Its Application to Physical Problems*, Addison-Wesley, Reading, Mass., 1962, p. 391.

2. J. P. ELLIOTT, "Collective motion in the nuclear shell model I and II," *Proc. Roy. Soc. London Ser. A*, v. 245, 1958, pp. 128, 562.

3. V. K. B. KOTA, "Plethysm problem of $U((n + 1)(n + 2)/2) \supset SU(3)$," *J. Phys. A*, v. 10, 1977, p. L39.

4. E. M. IBRAHIM, *Tables for the Plethysm of S-functions*, Roy. Soc. (London), Depository of unpublished tables, no. 1, 1950.