

962-15-1212

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Let  $M$  be an  $n \times n$  matrix with integer entries and suppose that  $M$  has  $n$ , not necessarily distinct, integer eigenvalues  $\{\lambda_1, \lambda_2, \dots, \lambda_n\}$ . Let  $K$  be the  $n \times n$  matrix whose  $ij$ -th entry is the integer  $k$ . We say that  $M$  has the **additive integral eigenvalue property** (AIEP) if the eigenvalues of  $M + K$  are  $\{\mu_1, \mu_2, \dots, \mu_n\}$  where  $\mu_i = \lambda_i + kn$  for some  $i$  and  $\mu_j = \lambda_j$  for all  $j \neq i$ . Let  $W_n$  be the set of all  $n \times n$  matrices with the AIEP. The authors investigate the structure of the  $\mathbb{Z}$ -modules in  $W_n$ . (Received October 02, 2000)