ON THE CONSTRUCTION OF CIRCULANT TENSOR CODES

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An $n \times n \times n$ Tensor over a field $F$ is an $n \times n \times n$ array

$$\Gamma = [\Gamma_{i,j,l}^n].$$

An $n \times n$ matrix $A = [a_{ij}]$ over a field $F$ is called circulant if

$$a_{i,j} = a_{i,(j-1) \text{mod } n}.$$ 

M.Roth investigated the study of tensor codes for the rank metric in the year 1996. These classes of codes play a vital role in the correction of crisscross errors found in memory chip arrays. We in this paper generalize the definition of $n \times n$ circulant matrices to $n \times n \times n$ circulant tensors. Using this we construct the class of $n \times n \times n$ circulant tensor codes for rank metric. Such a construction of codes lessens the complexity in the correction of erasures in the received codeword. Also we give an erasure decoding technique for these classes of circulant tensor codes.

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