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MULTI COVERING RADIUS OF CODES FOR RANK METRIC

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Covering radius happens to be one of the basic parameter of a code which is the smallest integer t such that every vector of length n has distance almost t from at least one code word. Andrew Klapper introduced the generalization of covering radius called the multi-covering radius in which one can study simultaneous coverings of sets of m vectors rather than single vector. Being a natural generalization of covering radius, he made such study mainly in case of codes with hamming metric. We in this paper investigate multi covering radius of codes for a rank distance (RD) codes which are endowed with rank metric. A linear RD code C of length n is a subspace (Subset) of $\{GF(2^N)]^n$ (where $n \leq N$ and $N > 1$) where d the norm (weight) of each vector is defined to be the maximum number of its co-ordinates that are linearly independent and the corresponding metric induced by this norm is called the rank metric. The m-covering radius of C denoted by $t_n(C)$ is the smallest radius such that every set of m vectors in the ambient space is contained in at least one ball of that radius around some code word. Here we study some fundamental properties of multi covering radius and prove basic bound on the existence of codes with certain parameters related to m-covering radius.

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