

A REVIEW OF PERFECT CODES IN CAYLEY GRAPHS

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ABSTRACT. A perfect t -code in a graph $G = (V, E)$ is a subset C of V such that every vertex of G is at distance no more than t to exactly one vertex in C . Perfect t -codes in Hamming graph $H(n, q)$ are precisely q -ary perfect t -codes of length n in the classical setting, and those in the Cartesian product $C_q \square \cdots \square C_q$ of cycle C_q with itself n times are precisely q -ary perfect t -codes of length n under the Lee metric. Since both $H(n, q)$ and $C_q \square \cdots \square C_q$ are Cayley graphs, perfect codes in Cayley graphs can be considered as generalisations of perfect codes in classical coding theory, and perfect 1-codes in Cayley graphs are closely related to tilings of the underlying groups. In this talk, I will review selected results on perfect codes in Cayley graphs with an emphasis on perfect 1-codes.