Abstract

On additive codes over GF(4) and their applications

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After the publication [1], additive self-orthogonal codes over GF(4) under a trace inner product became of interest because of their correspondence to additive (or stabilizer) quantum error-correcting codes. Several papers were devoted to classifying or constructing additive self-dual codes over GF(4). It was shown [2] that certain vectors in some additive self-dual codes over GF(4) hold generalized t-designs as well as classical t-designs with possibly repeated blocks. Also, every additive self-dual code over GF(4) can be uniquely represented as an undirected graph, and conversely. These facts motivate the construction of additive self-dual codes over GF(4).

In this work we consider some constructive algorithms for additive self-dual codes over GF(4). We use these algorithms to construct new codes. Also, we describe the relations between this class of codes and other combinatorial structures.

References

[1] A. R. Calderbank, E. M. Rains, P. W. Shor, N. J. A. Sloane. Quantum error correction via codes over GF(4), *IEEE Trans. Inform. Theory.* 44 (1998), 1369–1387.

[2] J.-L. Kim, V. Pless, Designs in Additive Codes over GF(4), *Designs, Codes and Cryptography*, Vol 30, (2003), 187–199