

Some local group algebras and complementary dual abelian codes

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Abstract

Abelian codes and complementary dual codes form important classes of linear codes that have been extensively studied due to their rich algebraic structures and wide applications. In this talk, a family of abelian codes with complementary dual in a group algebra $\mathbb{F}_{p^\nu}[G]$ has been studied under both the Euclidean and Hermitian inner products, where p is a prime, ν is a positive integer and G is an arbitrary finite abelian group. Based on the discrete Fourier transform decomposition for semi-simple group algebras and properties of ideas in local group algebras, the characterization of such codes have been given. Subsequently, the number of complementary dual abelian codes in $\mathbb{F}_{p^\nu}[G]$ has been shown to be independent of the Sylow p -subgroup of G and it has been completely determined for every finite abelian group G . In some cases, a simplified formula for the enumeration has been provided as well. The known results for cyclic complementary dual codes can be viewed as corollaries.

Reference

- [1] Boripan, A., **Jitman, S.**, Udomkavanich, P.: Characterization and enumeration of complementary dual abelian codes, *Journal of Applied Mathematics and Computing*, to appear. <https://doi.org/10.1007/s12190-017-1155-7>.