

Abstract

Let F_{q^2} be the finite field of q^2 elements, where q is a power of a prime number, and let D_{2n} be the dihedral group of $2n$ elements. Left ideals of the group algebra $F_{q^2}[D_{2n}]$ are called left dihedral codes over F_{q^2} of length $2n$, and abbreviated as left D_{2n} -codes. Let $\gcd(n, q) = 1$. In this talk, we give an explicit representation for the Hermitian dual code and the Hermitian hull of every left D_{2n} -code over F_{q^2} . On this basis, we determine all distinct Hermitian self-dual left D_{2n} -codes, Hermitian LCD left D_{2n} -codes, and Hermitian self-orthogonal left D_{2n} -codes over F_{q^2} , respectively. Further, we provide an explicit representation and a precise enumeration for these three subclasses of left D_{2n} -codes. As an application, we provide several illustrative examples for obtaining Hermitian self-dual and Hermitian LCD left D_{2n} -codes respectively.