Abstract

In this paper, two different Gray like maps from $Z_p^{\alpha} \times Z_{p^k}^{\beta}$ to Z_p^n, $n = \alpha + \beta p^{k-1}$, denoted by ϕ and φ, respectively, are presented, where p is a prime number. We have determined the connection between the weight enumerators among the image codes under these two mappings. We show that if C is a $Z_p Z_{p^k}$-additive code, and $C^{\perp}$ is its dual, then the weight enumerators of the image p-ary codes $\phi(C)$ and $\varphi(C^{\perp})$ are formally dual. This is a partial generalization of [D. S. Krotov, On Z_{2^k}-dual binary codes, IEEE Transactions on Information Theory, 2007, 53(4):1532--1537], and the result is generalized to odd characteristic p and mixed alphabet $Z_p Z_{p^2} \ldots Z_{p^k}$. Additionally, a construction of 1-perfect additive codes in the mixed $Z_p Z_{p^2} \ldots Z_{p^k}$ alphabet with distance $d^{\diamond}$ is given.