Abstract

Let p be any odd prime number and let m, k be arbitrary positive integers.The construction for self-dual cyclic codes of length p^k over the Galois ring ${\rm GR}(p^2,m)$ is the key to construct self-dual cyclic codes of arbitrary length p^kn over the integer residue class ring $\mathbb{Z}_{p^2}$ for any positive integer n satisfying ${\rm gcd}(p,n)=1$.So far, existing literature has only determined the number of these self-dual cyclic codes [Des. Codes Cryptogr. {\bf 63}, 105--112 (2012)]. In this talk, we give an efficient construction for all distinct self-dual cyclic codes of length p^k over ${\rm GR}(p^2,m)$ by using column vectors of Kronecker products of matrices with specific types. On this basis, we further obtain an explicit expression for all these self-dual cyclic codes by using combination numbers.