Abstract

In this talk, we introduce the notion of λ-constacyclic codes over the finite ring R for any λ of R. We study the non-invertible element constacyclic codes (NIE-constacyclic codes) over finite principal ideal rings (PIRs). We first characterize algebraic structures of all NIE-constacyclic codes over finite chain rings and their minimum Hamming distance. A general form of the duals of NIE-constacyclic codes over finite chain rings is also provided. In particular, we provide a necessary and sufficient condition for the dual of an NIE-constacyclic code to be an NIE-constacyclic code. Using Chinese Remainder Theorem, we obtain algebraic structures and minimum Hamming distances of NIE-constacyclic codes over finite PIRs. Specially, we construct some optimal NIE-constacyclic codes over finite PIRs in the sense that they can achieve the maximum possible minimum Hamming distance for some given length and cardinality. This talk is based on joint work with Jingge Liu.