

Polycyclic Codes over Finite Commutative Local Rings: from Simple-root to Repeated-root

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In this presentation, we describe the structural properties of polycyclic codes over Ore extension rings — (σ, δ) -polycyclic codes. Specifically, our discussion encompasses Euclidean and annihilator duals, Hamming isometrical equivalence, the Mattson-Solomon transform, and the decomposition of these codes.

Polycyclic codes, as special cases of (σ, δ) -polycyclic codes, are classified into two main groups: simple-root polycyclic codes and repeated-root polycyclic codes. We explore repeated-root polycyclic codes over fields, illustrating them as the matrix product of simple-root polycyclic codes.