

# SRIM and SCRIM Divisors of $x^n - 1$ over Finite Fields and Their Applications in Coding Theory

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## Abstract

Self-reciprocal and self-conjugate-reciprocal polynomials over finite fields have been of interest due to their rich algebraic structures and wide applications. In this talk, we focus on self-reciprocal irreducible monic (SRIM) and self-conjugate-reciprocal irreducible monic (SCRIM) factors of  $x^n - 1$  over finite fields and their applications. Their characterizations are given together with the enumeration formulas. In many cases, recursive formulas for the number of SRIM and SCRIM factors of  $x^n - 1$  are given as well. As applications, various properties of complementary dual cyclic codes, self-dual cyclic codes, and hull of cyclic codes over finite fields can be determined in terms of SRIM and SCRIM factors of  $x^n - 1$ .

## Reference

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