

Skew cyclic codes

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Abstract: Cyclic structures on convolutional codes were first considered in [10]. From a pure mathematical perspective, these are understood as left ideals of an Ore extension of a finite algebra. This idea has been developed, for example, in [11], [3], [2], [9], [7]. In [4], an alternative way to endow convolutional codes with cyclic structures is proposed. Thus, the so-called skew cyclic convolutional codes are understood as left ideals of a suitable factor ring of a skew polynomial ring with coefficients in the rational function field of a finite field. In [6], this is extended naturally to codes over an arbitrary field, yielding the notion of skew cyclic code, covering simultaneously the block [1] and convolutional cases. By a careful choice of the non commutative roots of the generator polynomial, skew Reed-Solomon codes were constructed and studied in [6] and [7], and they were proved to be MDS, with the help of the theory developed in [8]. Additionally, non commutative Peterson-Gorenstein-Zierler and Sugiyama decoding algorithms are proposed. The aim of this talk is to describe some of these ideas and constructions.

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