

1057-94-277

Sergio R López-Permouth* (lopez@math.ohiou.edu), 321 Morton Hall, Department of Mathematics, Athens, OH 45701, and **Steve Szabo** (szabo@math.ohiou.edu), 321 Morton Hall, Ohio University, Athens, OH 45701. *Convolutional Codes with Additional Structure*. Preliminary report.

The notion of cyclic convolutional codes as studied in various papers by Guessing-Luersen et al is extended to describe a larger family of codes which is large enough to include, among others, the group convolutional codes studied by Estrada et al. The ingredients to create such codes are a semisimple artinian algebra A (the word ambient), an automorphism σ on A , and a σ -derivation δ on A . One of the contributions of this study is precisely the introduction of δ as an element to consider in this construction.

In general, the convolutional codes we study here are certain left ideals of the general skew polynomial ring $R = A[z; \sigma, \delta]$. Conditions on σ and δ for the existence of non-block convolutional codes are given. It is shown that when the word ambient A is commutative the induced convolutional codes are principal left ideals of R . Various techniques from the theory of cyclic convolutional codes are expanded to this new setting and used to provide a matrix based view of group convolutional codes.

Our presentation will focus on showing how this approach allows us to extend previous results on cyclic convolutional codes to explicitly produce duals for some group convolutional codes. (Received January 25, 2010)