998-94-59 **Ivelisse M Rubio*** (ive@www.uprh.edu), Department of Mathematics, University of Puerto Rico, Humacao, PR 00791, and **Carlos J. Corrada-Bravo** (itaycao@coqui.net), Department of Computer Science, University of Puerto Rico, Rio Piedras, PR 00791. *Interleavers for Turbo Codes Constructed Using Dickson Polynomials.* Preliminary report.

One of the main components of a turbo encoder is the interleaver, which permutes the information symbols. The best known interleavers are obtained using S-random constructions. Although good performance can be obtained with them, they are bad for implementation and performance analysis.

Parameters normally associated to good turbo encoders are the spreading and dispersion of the interleaver. Simulation data suggests that another important property is the relation of the length of the permutation cycles and of the convolutional code.

In this talk we present an algebraic construction for interleavers of length p^r, p prime, that uses permutations of the finite field F_{p^r} obtained using Dickson polynomials to construct permutations of Z_{p^r}. We characterize certain types of Dickson polynomials that produce permutations with cycles of the same length and construct interleavers with the desired cyclic decomposition. These interleavers do not have to be stored in memory and their performance is as good or better than random and other algebraic interleavers. A class of these polynomials have the additional advantage that they produce permutations that are their own inverse and hence the same implementation used at encoding can be used at decoding. (Received January 14, 2004)