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*Ordered Orthogonal Array Construction Using LFSR Sequences*

In this talk, we discuss a new construction of ordered orthogonal arrays (OOA) of strength $t$ with $(q+1)t$ columns over a finite field $\mathbb{F}_q$ using linear feedback shift register sequences (LFSRs). OOAs are naturally related to $(t, m, s)$-nets, linear codes, and MDS codes. Our construction selects suitable columns from the array formed by all subintervals of length $\frac{q^t-1}{q-1}$ of an LFSR sequence generated by a primitive polynomial of degree $t$ over $\mathbb{F}_q$. The set of parameters of our OOAs are the same as the ones given by Rosenbloom and Tsfasman (1997) and Skriganov (2002), but the constructed arrays are different. We experimentally verify that our OOAs are stronger than the Rosenbloom-Tsfasman-Skriganov OOAs in the sense that ours are "closer" to being a "full" orthogonal array. We also discuss how our OOA construction relates to previous techniques to build OOAs from a set of linearly independent vectors over $\mathbb{F}_q$, as well as to hypergraph homomorphisms. This is joint work with André Castoldi (Brazil), Daniel Panario (Canada) and Brett Stevens (Canada), which recently appeared in *IEEE Transactions on Information Theory* vol. 68 (2017).