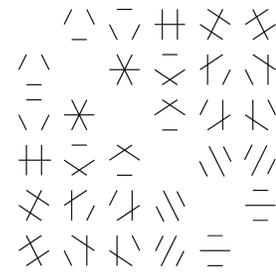


Mathematics Seminar



Rocky Mountain Algebraic Combinatorics Seminar

Existence Conditions for Binary Complementary Code Sets

Greg Coxson
Naval Research Lab, MD

Complementary code sets are a design option in radar and communication applications that involve pulse compression. In theory, they provide what single pulse compression codes cannot - zero autocorrelation sidelobes. Throughout, the goal is to find practical existence conditions for (N,K) complementary code sets, N being the code length and K the number of codes, that waveform designers to add to their toolbox. The talk will focus on the case of complementary sets of binary ± 1 codes.

The talk will begin with a brief discussion of pulse compression, and move next to complementary code sets and a useful matrix formulation (the complementary code matrices, or CCMs). A special case of CCMs are the well-known Hadamard matrices. The CCM formulation will then be shown to yield a simple and natural existence condition. Examination of special cases will draw upon enumeration formulae from recent work in Number Theory. Finally, it will be shown that the existence condition can be refined, providing a way to identify allowable CCM structures for given N and K .

Clean and Strongly Clean Rings

Tom Dorsey
Center for Communications Research, La Jolla

An element of a ring is said to be clean if it is a sum of a unit and an idempotent; strongly clean if it is a sum of a unit and idempotent that commute. A ring is said to be (strongly) clean if each of its elements is (strongly) clean. These classes of rings fit well with classical topics in ring theory such as cancellation and decomposition of modules, von Neumann regular rings, and, especially, Fitting's Lemma. I'll discuss the behavior of these classes under certain types of extensions, and touch on some open problems.

Weber 223
4-6 pm
Friday, November 14, 2014
(Refreshments in Weber 117, 3:30-4 pm)
Colorado State University

This is a joint Denver U / UC Boulder / UC Denver / U of Wyoming / CSU seminar that meets biweekly.
Anyone interested is welcome to join us at a local restaurant for dinner after the talks.



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