NORTHERN ARIZONA UNIVERSITY

Department of Mathematics and Statistics Colloquium

Tuesday, March 12, 2019

AMB 164 4:00 pm

New extremal binary self-dual codes and designs from a Baumert-Hall array

Bahattin Yildiz

NAU Maths/Stats

Abstract

In this work, we introduce new construction methods for self-dual codes using a Baumert-Hall array. We apply the constructions over the alphabets $\mathbb{F}_2$ and $\mathbb{F}_4 + u\mathbb{F}_4$ and combine them with extension theorems and neighboring constructions. As a result, we construct 46 new extremal binary self-dual codes of length 68, 26 new best known Type II codes of length 72 and 8 new extremal Type II codes of length 80 that lead to new $3-(80, 16, 665)$ designs. Among the new codes of length 68 are the examples of codes with the rare $\gamma = 5$ parameter in $W_{68,2}$.

Refreshments at 3:45