

Discrete Mathematics Seminar

Time: Friday, 9 September 2011, 12:30–1:30 PM
Location: 238 Derrick Hall
Title: Extremal Cayley Digraphs of Finite Abelian Groups
Speaker: Dr. Xingde Jia, Mathematics Department

Abstract:

Cayley digraphs of finite abelian groups are often used to model communication networks. Because of their applications, extremal Cayley digraphs have been studied extensively in recent years. Given any positive integers d and k . Let $m_*(d, k)$ denote the largest positive integer m such that there exists an m -element finite abelian group Γ and a k -element subset A of Γ such that $\text{diam}(\text{Cay}(\Gamma, A)) \leq d$, where $\text{diam}(\text{Cay}(\Gamma, A))$ denotes the diameter of the Cayley digraph $\text{Cay}(\Gamma, A)$ of Γ generated by A . Similarly, let $m(d, k)$ denote the largest positive integer m such that there exists a k -element set A of integers with $\text{diam}(\mathbf{Z}_m, A) \leq d$. In this paper, we prove, among other results, that

$$m_*(d, k) = m(d, k)$$

for all $d \geq 1$ and $k \geq 1$. This means that the finite abelian group whose Cayley digraph is optimal with respect to its diameter and degree is always a cyclic group. This is joint work with Abby Gail Mask and Joni Scheider.