UNIVERSITY OF PUERTO RICO
RIO PIEDRAS CAMPUS

FACULTY OF NATURAL SCIENCES
DEPARTMENT OF MATHEMATICS

SEMINAR

SOME ADVANCES IN PERFECT DOMINATION
IN Λ_n

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Abstract

For $0 < n \in \mathbb{Z}$, let Λ_n be the graph whose vertex set is the integer lattice $\mathbb{Z}^n$ with an edge between any two vertices whenever their Euclidean distance is 1. The subgraph of Λ_n induced by the set of vertices whose coordinates belong to $\{0, 1\}$ is called an *n-cube* Q_n.

In this talk, we show some values of n and s of the form $n = 2^r - 1$ and $s = n + 2^{r-1}k$, or $n = 3^r - 1$ and $s = n + 3^r k$, where $0 < r \in \mathbb{Z}$ and $0 \leq k \in \mathbb{Z}$, such that the unit distance graph on $\mathbb{Z}^s$ has a perfect dominating set whose induced components are n-cubes. In showing this, an abelian group epimorphisms $\mathbb{Z}^n \to G$ is employed that becomes bijective over the closed neighborhood of an induced component.

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