Abstract

Exact Minimum Density of Codes Identifying Vertices in the Square Grid

Yael Ben-Haim and Simon Litsyn

School of Electrical Engineering
Tel-Aviv University
Tel-Aviv 69978
Israel

An identifying code C is a subset of the vertices of the square grid $\mathbb{Z}^2$ with the property that for each element v of $\mathbb{Z}^2$, the collection of elements from C at distance at most one from v is non-empty and distinct from the collection of any other vertex. We prove that the minimum density of C within $\mathbb{Z}^2$ is $\frac{7}{20}$.