

IS THE MULTIDIMENSIONAL ODD SHIFT SOFIC?

MICHAEL HOCHMAN

Interpret a configuration $x \in \{0, 1\}^{\mathbb{Z}^d}$ as a percolation, i.e. as defining a subset of \mathbb{Z}^d (the 1's) which in turn induces a subgraph of \mathbb{Z}^d , where as edges we take points whose ℓ^1 -distance is 1 (this is the same as taking the Cayley graph of \mathbb{Z}^d with the standard generating set). We can now talk about the connected components of x .

Let $X \subseteq \{0, 1\}^{\mathbb{Z}^d}$ be the set of configurations in which every finite component has even size, and Y the set of configurations of odd size. It is an exercise to show that X is sofic.

Problem. Is Y sofic?

I believe that it is not, but I have no idea how to prove it.