Characterization of Three Dimensional Cellular Automata over $\mathbb{Z}_m$

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Abstract

Three dimensional cellular automata wasn't much studied by researches. Tsalides *et al.* characterized three dimensional cellular automata in [1] and then Hemmingsson investigated quasi periodic behavior of three dimensional cellular automata in [2]. In this work we study the algebraic behavior of three dimensional linear cellular automata over $\mathbb{Z}_m$. we provide necessary and sufficient conditions for a three dimensional linear cellular automata over the ring $\mathbb{Z}_m$ to be reversible or irreversible. As a consequence of our result we characterize three dimensional linear cellular automata under the null boundary conditions.

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References

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