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Computing Shifts in 90/150 Cellular Automata Sequences

Palash Sarkar

Abstract   Sequences produced by cellular automata (CA) are studied algebraically. A suitable k-cell 90/150 CA over $\mathbb{F}_q$ generates a sequence of length $q^k - 1$. The temporal sequence of any cell of such a CA can be obtained by shifting the temporal sequence of any other cell. We obtain a general algorithm to compute these relative shifts. This is achieved by developing the proper algebraic framework for the study of CA sequences.