

## DYNAMICS OF (PSEUDO) AUTOMORPHISMS OF 3-SPACE: PERIODICITY VERSUS POSITIVE ENTROPY

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**Abstract:** We study the iteration of the family of maps given by 3-step linear fractional recurrences. This family was studied earlier from the point of view of finding periodicities. In this paper we finish that study by determining all possible periods within this family. The novelty of our approach is that we apply the methods of complex dynamical systems. This leads to two classes of interesting pseudo automorphisms of infinite order. One of the classes consists of completely integrable maps. The other class consists of maps of positive entropy which have an invariant family of  $K3$  surfaces.

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**Key words:** Pseudo-automorphism, rational 3 fold,  $K3$  surfaces, rational recurrences, birational map, dynamical degree, periodicity.