

Periodicity of solenoidal automorphisms

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Characterization of the sets of periodic points of a family of dynamical systems is a well studied problem in the literature. Here, we consider this problem for the family of automorphisms on a solenoid. By definition, a solenoid Σ is a compact connected finite dimensional abelian group. Equivalently, a topological group Σ will be a solenoid if its Pontryagin dual $\widehat{\Sigma}$ is a subgroup of \mathbb{Q}^n and also contains \mathbb{Z}^n as a subgroup for some positive integer n . When the dual is equal to \mathbb{Z}^n , the solenoid is actually an n -dimensional torus, while its known as a full solenoid when the dual is \mathbb{Q}^n . Previously the characterization has been done on n -dimensional torus, full solenoids and also for the alternate description by considering a one-dimensional solenoid as the inverse limit of a sequence of maps on unit circle.

This talk is based upon a pre-print, related to our recent work about the extension of periodic point characterization to n -dimensional solenoids, whose duals are subgroups of algebraic number fields. Here, we used the theory of adèles for describing a solenoid and the periodic points of its automorphisms. The ring of adèles $\mathbb{A}_{\mathbb{K}}$ of an algebraic number field \mathbb{K} , is the restricted product of \mathbb{K}_v 's with respect to \mathfrak{R}_v 's, where \mathbb{K}_v is the completion of \mathbb{K} with respect to a place v and \mathfrak{R}_v is an open, unique maximal compact subring of \mathbb{K}_v .

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