Principal algebraic actions of the discrete Heisenberg group

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Stellingen

behorende bij het proefschrift

Principal algebraic actions of the discrete Heisenberg group

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(1) The study of algebraic dynamical systems benefits from its connection to a variety of different fields in mathematics (e.g., algebraic geometry, harmonic analysis and probability theory).

(2) Summable homoclinic points play a major role in algebraic dynamics, e.g., they are of paramount importance for the construction of symbolic covers (cf. Chapter 1).

(3) Certain interesting non-algebraic dynamical systems can be linked in a natural way to algebraic dynamical systems. Hence, knowledge about dynamical properties of algebraic systems can be transferred to non-algebraic ones.

(4) Irrational circle rotations are dearly beloved textbook examples in the field of dynamics, but they also form a monstrous obstacle for studying principal actions of the discrete Heisenberg group.

(5) Local principles have been successfully used to determine expansiveness of principal algebraic actions of the discrete Heisenberg group (cf. Chapter 2).

(6) For nilpotent groups, invertibility of an element in the group algebra can be checked by studying invertibility of its projections on factor spaces with respect to all primitive ideals. This gives a representation theoretical method to check invertibility that does not rely on the knowledge of the usually unmanageable or even indeterminable dual of the group (cf. Chapter 3).

(7) The abstract concept of representing a C^*-algebra as the set of continuous elements of a bundle provides a powerful tool to find summable homoclinic points of non-expansive principal algebraic actions of the discrete Heisenberg group (cf. Chapter 4).

(8) A Wiener Lemma for the group algebras of the discrete Heisenberg group and of the integers can be written in exactly the same form: an element in the group algebra is invertible if and only if the inverse of its localisation is a bounded and continuous map on the unit interval.

(9) Whoever aims to formulate an ingenious and humorous proposition is doomed to fail – the empirical evidence is striking.