

# NUCLEAR DIMENSION OF CROSSED PRODUCTS ASSOCIATED TO PARTIAL AUTOMORPHISMS

ABSTRACT

Let  $\alpha : \mathbb{Z} \rightarrow \text{Aut}(A)$  be an action of the integers, on a  $C^*$ -algebra  $A$  of finite nuclear dimension. It is still unknown whether  $A \rtimes_{\alpha} \mathbb{Z}$  has finite nuclear dimension. One approach would be to impose conditions on the action. This was done first by Hirshberg, Winter and Zacharias, in [4]. They introduced the notion of actions with finite Rokhlin dimension, and showed that

$$\dim_{\text{nuc}}(A \rtimes_{\alpha} \mathbb{Z}) \leq 4(\dim_{\text{Rok}}(\alpha) + 1)(\dim_{\text{nuc}}(A) + 1) - 1 .$$

Taking  $A$  to be a commutative  $C^*$ -algebra, Szabó proved, in [1], that finite Rokhlin dimension is equivalent to freeness. Hirshberg and Wu could then show, in [3], that for any action  $\alpha : \mathbb{Z} \rightarrow \text{Aut}(C_0(X))$ ,

$$\dim_{\text{nuc}}(C_0(X) \rtimes \mathbb{Z}) \leq 2\dim_{\text{nuc}}(C_0(X))^2 + 6\dim_{\text{nuc}}(C_0(X)) + 4 .$$

We generalize this result to a class of partial dynamical systems, generated by a homeomorphism  $\theta : U \rightarrow V$ , between open subsets of  $X$ , introduced by Exel in [2].

## REFERENCES

- [1] Szabó, Gábor, *The Rokhlin dimension of topological  $\mathbb{Z}^m$ -actions*, Proc. Lond. Math. Soc. (3) **110** (2015), 673–694.
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- [3] Hirshberg, Ilan and Wu, Jianchao, *The nuclear dimension of  $C^*$ -algebras associated to homeomorphisms*, Adv. Math. **304** (2017), 56–89.
- [4] Hirshberg, Ilan and Winter, Wilhelm and Zacharias, Joachim, *Rokhlin dimension and  $C^*$ -dynamics*, Comm. Math. Phys. **335** (2015), 637–670.