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Furstenberg boundaries for pairs of groups. (English) Zbl 1461.37030

Let $G$ be a topological group. For each subgroup $H < G$, let $\hat{H}$ stand for its hull. In this paper, the Furstenberg boundary $\partial(G, H)$ is determined and some properties of it are highlighted.

The following are the main results.

Theorem 1. Let $G$ be a topological group admitting a co-compact relatively amenable subgroup $P$. Then, $\partial(G, H) = G/H$, for any closed subgroup $H$ containing $\hat{P}$.

Theorem 2. The following statements are valid for affine groups of $\mathbb{R}^2$:
1. The Furstenberg boundary $\partial(G, H)$ is isomorphic to $\alpha(\mathbb{R}^2)$;
2. The $\mathbb{R}^2$-action of the corona $\alpha(\mathbb{R}^2) \setminus \mathbb{R}^2$ is trivial;
3. The identification $\mathbb{R}^2 \equiv D^0$ extends to a $G$-map $\alpha(\mathbb{R}^2) \to D$ sending the corona onto $S^1$;
4. The compact space $\alpha(\mathbb{R}^2)$ is non-metrizable.

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MSC:
37C85 Dynamics induced by group actions other than $\mathbb{Z}$ and $\mathbb{R}$, and $\mathbb{C}$
37B02 Dynamics in general topological spaces
37B05 Dynamical systems involving transformations and group actions with special properties (minimality, distality, proximality, expansivity, etc.)
22F05 General theory of group and pseudogroup actions

Keywords:
topological dynamics; Furstenberg boundary; group actions; amenability

Full Text: DOI arXiv

References:
with an appendix by M. Burger. · Zbl 0759.22001


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