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THE CAPTURING OPERATION IN TOPOLOGICAL DYNAMICS

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Abstract. We use the capturing operation to develop a partial classification of minimal flows with the same Ellis group.

1. Introduction

A fundamental problem in topological dynamics is the classification of minimal flows. A partial classification (up to "proximal equivalence") is provided by the *Ellis groups* which are closed subgroups of the automorphism group of the universal minimal flow. A remaining problem is to distinguish minimal flows in the same "proximal class" (equivalently with the same Ellis group). This issue is addressed in the present paper. The main tool is the capturing operation, which is a kind of reverse orbit closure.

2. Some Definitions and Known Results

We begin by reviewing some dynamical notions (see [1] and [3]).

A *flow* (X, T) is a jointly continuous action $(x, t) \mapsto xt$ of a topological group T on a compact Hausdorff space X. A *minimal set* is a non-empty, closed T invariant set, which is minimal with respect to these properties. Equivalently, a non-empty subset K of X is minimal if it is the orbit closure of each of its points $\overline{xT} = K$ for all $x \in K$. It follows from Zorn's Lemma that minimal sets always exist for a flow on a compact space.

If $\overline{xT}$ is minimal, x is said to be an *almost periodic point.* If (X, T) is minimal, (so $\overline{xT} = X$ for all $x \in X$) we say (X, T) is a *minimal flow.*

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