

Non-compact and Non-trivial Minimal Sets of a Locally Compact Flow

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Introduction

The structure of the compact minimal sets of a flow is well known [1, p. 38]. However, the literature on the non-compact minimal sets seems rather scanty [1, p. 40].

The purpose of this paper is to investigate the structure of non-compact and non-trivial minimal sets of a locally compact flow, i.e., a dynamical system on a locally compact metric space.

The main results obtained are as follows.

1) The non-compact and non-trivial minimal set of a locally compact flow consists of infinitely many trajectories (Theorem 2).

2) The non-compact and non-trivial minimal set of a locally compact flow consists of the points which are

- i) Poisson stable,
 - ii) positively Poisson stable and negatively receding,
 - iii) negatively Poisson stable and positively receding,
- and they all exist simultaneously (Theorem 3).

3) Poisson stable trajectories in the non-compact and non-trivial minimal set of the locally compact flow are neither pseudorecurrent nor almost recurrent (Theorem 4).

4) The set of all Poisson stable points in the non-compact and non-trivial minimal set of a locally compact flow is dense in the minimal set (Theorem 1).

§1. Standing notations and definitions.

N is the set of all natural numbers. R is the real line. R^+ denotes the set $\{t \in R; t \geq 0\}$. R^- denotes the set $\{t \in R; t \leq 0\}$.