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# MINIMAL TRANSFORMATION GROUPS WITH DISTAL POINTS

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The purpose of the present note is to announce results concerning the structure of transformation groups (hereinafter called flows) which are minimal and have distal points. Detailed proofs will appear in [9].

Fixed for the discussion is a group $T$, and we write $\mathfrak{X}$, $\mathfrak{Y}$, $\cdots$, $\mathfrak{Z}$ for flows $(T, X)$, $(T, Y)$, $\cdots$, $(T, Z)$. All phase spaces $X$, $Y$, $\cdots$, $Z$ are to be compact and metrizable. Below, $d(\cdot, \cdot)$ will denote a compatible metric for $X$. $\mathfrak{X}\xrightarrow{\pi}\mathfrak{Y}$ will be used to indicate a *homomorphism* of flows. That is, $\pi: X\to Y$ is continuous, surjective, and $\pi$ is equivariant ($\pi T = T\pi$). $\mathfrak{Y}$ is said to be a *factor* of $\mathfrak{X}$.

Given a flow $\mathfrak{X}$, a point $x\in X$ is *distal* for $\mathfrak{X}$ provided $\inf_{t\in T} d(tx, ty) \neq 0$, $y\neq x$. $\mathfrak{X}$ is *point-distal* if there exists a distal point $x\in X$ with dense orbit. Point-distal flows are minimal [1], [6] (the phase space has no proper, closed, invariant subset), and every factor of a point-distal flow is point-distal.

Our first theorem settles a question raised by Knapp [6]. A flow is *nontrivial* if its phase space has more than one point.

THEOREM 1. *Every nontrivial point-distal flow has a nontrivial equicontinuous factor.*

In preparation of Theorem 2 we recall the notion of an isometric extension which is due to Furstenberg [4]. Let $\mathfrak{X}\xrightarrow{\pi}\mathfrak{Y}$ be a homomorphism of flows, and let $S\subseteq X\times X$ be the set

$$S = \{(x_1, x_2) \mid \pi x_1 = \pi x_2\}.$$

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