Sankaran, P.; **Varadarajan, K.**

Acyclicity of certain homeomorphism groups. (English) Zbl 0711.57022

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A group G is called pseudo-mitotic if for every finitely generated subgroup B there are homomorphisms σ and δ of B into G and an inner automorphism γ of G such that $\sigma = \delta\gamma$, and $b\delta = b(b\sigma)$ for all $b \in B$, and $[b', b\sigma] = 1$ for all $b, b' \in B$. A group is said to be acyclic if all its homology groups over the integers with trivial group action vanish in all dimensions ≥ 1. It was proved by the second author [J. Pure Appl. Algebra 37, 205-213 (1985; Zbl 0569.20039)] that pseudo-mitotic groups are acyclic and that the group G_n of homeomorphisms of $\mathbb{R}^n$ with compact support is pseudo-mitotic. In the present paper techniques are developed to prove pseudo-mitoticity of certain other homeomorphism groups. It is proved among others that the group of homeomorphisms of the rationals $\mathbb{Q}$ (resp. the irrationals) with bounded support is pseudo-mitotic, in particular acyclic. This result is inspired by a result of *D. M. Kan* and *W. P. Thurston* [Topology 15, 253-258 (1976; Zbl 0355.55004)]. It is also proved that the group of homeomorphisms of the Cantor set which are the identity in a neighbourhood of 0 and 1 is pseudo-mitotic and hence acyclic.

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MSC:

57S05 Topological properties of groups of homeomorphisms or diffeomorphisms

20J99 Connections of group theory with homological algebra and category theory

54H15 Transformation groups and semigroups (topological aspects)

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