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Sela, Z.

Acylindrical accessibility for groups. (English) Zbl 0887.20017

Invent. Math. 129, No. 3, 527-565 (1997).

The author introduces the following notion of acylindricity for a graph of groups. First, he calls a splitting (graph of groups) of a group reduced if the label of every vertex of valence 2 contains the label of both edges incident to it. If T is the Bass-Serre tree for a given splitting of a group G, then, the splitting (graph of groups) and T are said to be k-acylindrical if they are reduced, if T is minimal, and if for all elements $g \in G$, $g \neq 1$, the fixed point of G has diameter bounded by k.

With this notion, the author obtains a bound for the combinatorics of the graphs of groups for finitely generated freely indecomposable groups. As an application, he proves the finiteness of acylindrical surfaces in closed 3-manifolds (a result due to J. Hass), the finiteness of isomorphism classes of small splittings of torsion-free freely indecomposable hyperbolic groups and finiteness results for small splittings of finitely generated Kleinian and semisimple discrete groups acting on non-positively curved simply connected manifolds.

The arguments in this paper include a generalization of Rips' analysis of stable actions of finitely presented groups on real trees to finitely generated groups. The theory developed in this paper has been used by the author in several of his recent works, namely, the construction of a canonical Jaco-Shalen-Johannson decomposition for groups [see *E. Rips* and *Z. Sela*, Ann. Math., II. Ser. 146, No. 1, 53-109 (1997)], the Hopf property for hyperbolic groups [*Z. Sela*, Endomorphisms of hyperbolic groups. I: The Hopf property, (preprint)] and the study of sets of solutions for equations in a free group [*Z. Sela*, Moduli spaces of residually free groups, (preprint)].

Reviewer: A.Papadopoulos (Strasbourg)

MSC:

20F65	Geometric group theory
20E08	Groups acting on trees
20E34	General structure theorems for groups
57M07	Topological methods in group theory
20E06	Free products of groups, free products with amalgamation, Higman-Neumann-Neumann extensions, and generalizations
20F05	Generators, relations, and presentations of groups

Cited in **2** Reviews
Cited in **58** Documents

Keywords:

hyperbolic groups; Gromov hyperbolicity; combinatorial group theory; finitely generated groups; accessibility; Bass-Serre theory; splittings of groups; graphs of groups; freely indecomposable groups

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