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FINITE EXTENSIONS OF $\mathcal{H}$- AND $\mathcal{AH}$-ACCESSIBLE GROUPS

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Abstract. We prove that the group properties of being $\mathcal{H}$-accessible and $\mathcal{AH}$-accessible are preserved under finite extensions. We thus answer an open question posed by Carolyn Abbott, Sahana H. Balasubramanya, and Denis Osin in [*Hyperbolic structures on groups*, Algebr. Geom. Topol. 19 (2019), no. 4, 1747–1835].

1. Introduction

An important open question related to the class of acylindrically hyperbolic groups is the following (see [9, Question 2.20]).

Question 1.1. Is the property of being acylindrically hyperbolic preserved under quasi-isometries for finitely generated groups? In other words, if G is a finitely generated acylindrically hyperbolic group and H is a finitely generated group that is quasi-isometric to G, then is H also an acylindrically hyperbolic group?

A group G is called *acylindrically hyperbolic* if it admits a non-elementary, acylindrical action on a hyperbolic space. The motivation behind the following question comes from the observation that the class of acylindrically hyperbolic groups serves as a generalization to the classes of non-elementary hyperbolic and relatively hyperbolic groups. The latter two classes are preserved under quasi-isometries (see [6] and [5, Theorem 5.12]), making Question 1.1 a natural question to consider.

An answer to this question seems currently out of reach given the lack of techniques to build an action of H on a hyperbolic space simply

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