

A note on fine graphs and homological isoperimetric inequalities

Eduardo Martínez-Pedroza

Abstract. In the framework of homological characterizations of relative hyperbolicity, Groves and Manning posed the question of whether a simply connected 2-complex X with a linear homological isoperimetric inequality, a bound on the length of attaching maps of 2-cells and finitely many 2-cells adjacent to any edge must have a fine 1-skeleton. We provide a positive answer to this question. We revisit a homological characterization of relative hyperbolicity, and show that a group G is hyperbolic relative to a collection of subgroups \mathcal{P} if and only if G acts cocompactly with finite edge stabilizers on an connected 2-dimensional cell complex with a linear homological isoperimetric inequality and \mathcal{P} is a collection of representatives of conjugacy classes of vertex stabilizers.