

ABSTRACT. We study how bounds on the local geometry of a Riemannian polyhedral complex yield uniform local Poincaré inequalities. These inequalities have a variety of applications, including bounds on the heat kernel and a uniform local Harnack inequality. We additionally consider the example of a complex, X , which has a finitely generated group of isomorphisms, G , such that $X/G = Y$ is a complex consisting of a finite number of polytopes. We show that when this group, G , has polynomial volume growth, there is a uniform global Poincaré inequality on the complex, X .