

1096-05-1446

Colin Gavin and **Elizabeth Stanhope*** (stanhope@lclark.edu), 0615 SW Palatine Hill Road, Portland, OR 97219, and **Sam Stewart**. *Defining a graph theoretic analog to a Riemannian orbifold*. Preliminary report.

Riemannian orbifolds are a slight generalization of Riemannian manifolds. Instead of being locally diffeomorphic to R^n , Riemannian orbifolds are locally diffeomorphic to R^n modulo the isometric action of a finite group. Recently, a number of authors have examined orbifolds from the perspective of inverse spectral geometry. In light of the strong connection between spectral geometry and spectral graph theory, our project defines a graph theoretic parallel of an orbifold, called an orbigraph, and obtains spectral results about orbigraphs. The spectrum of the adjacency matrix of a k -orbigraph yields bounds on the number of singular (non k -star) vertices present in the orbigraph. The reversibility (as in Markov chains) of an orbigraph determines if it can be obtained as the quotient of a finite k -regular graph. Both the definition of an orbigraph and our results about them are new. (Received September 15, 2013)