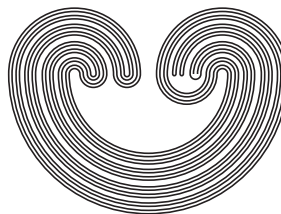


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GROWTH SERIES OF $CAT(0)$ CUBICAL COMPLEXES

by

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GROWTH SERIES OF CAT(0) CUBICAL COMPLEXES

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ABSTRACT. Let X be a CAT(0) cubical complex. The growth series of X at x is $G_x(t) = \sum_{y \in \text{Vert}(X)} t^{d(x,y)}$, where $d(x,y)$ denotes ℓ_1 -distance between x and y . If X is cocompact, then G_x is a rational function of t . In the case when X is the Davis complex of a right-angled Coxeter group it is well known that $G_x(t) = 1/f_L(-t/(1+t))$, where f_L denotes the f -polynomial of the link L of a vertex of X . We obtain a similar formula for general cocompact X . We also obtain a simple relation between the growth series of individual orbits and the f -polynomials of various links. In particular, we get a simple proof of reciprocity of these series ($G_x(t) = \pm G_x(t^{-1})$) for an Eulerian manifold X .

Let X be a CAT(0) cube complex with a cocompact cellular action by a group G . Denote by $d(x,y)$ the ℓ_1 -distance between vertices x and y of X . We consider the following growth series:

$$G_{xy} = \sum_{z \in Gy} t^{d(x,z)}$$

— the growth series of G -orbit of y as seen from x , and

$$G_x = \sum_{y \in X} t^{d(x,y)}$$

— the full growth series of X as seen from x .

The aim of this paper is to establish relations between these growth series and the local structure of X and X/G . In order to do this we

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