

Morgan, John W.; Otal, Jean-Pierre

Relative growth rates of closed geodesics on a surface under varying hyperbolic structures.

(English) [Zbl 0795.57009](#)

Comment. Math. Helv. 68, No. 2, 171-208 (1993).

The main result of the paper gives 2 necessary and sufficient conditions that a minimal action of a surface group (the fundamental group of a closed surface) on a tree be geometric that is dual to a codimension-1 measured lamination on the surface. For actions of surface groups on simplicial trees this is a classical result of Stallings stating that such an action is dual to a compact 1-dimensional submanifold of the surface (the simplest case of a lamination) if and only if the stabilizer of every edge of the tree is cyclic. This is also the first condition in the main theorem of the present paper which works for actions of surface groups on \mathbb{R} -trees and on Λ -trees for more general ordered abelian groups Λ . In the meantime (the present paper was first submitted in May 1987!) *R. K. Skora* [*Bull. Am. Math. Soc., New Ser.* 23, No. 1, 85-90 (1990; [Zbl 0708.30044](#))] proved that this first condition really suffices. The second goal of the paper is to study the limiting ratios of lengths of simple closed geodesics under a degenerating sequence of hyperbolic structures on the surface which determine a point in the projective Thurston compactification of Teichmüller space. As a corollary of the above theorem a new and more direct proof is obtained of the result that all projective limit points of Teichmüller space are given by intersection numbers with a fixed measured lamination.

Reviewer: [B.Zimmermann \(Trieste\)](#)

MSC:

[57M99](#) General low-dimensional topology

Cited in **2** Reviews
Cited in **9** Documents

Keywords:

[minimal action](#); [surface group](#); [tree](#); [measured lamination](#); [hyperbolic structures](#); [projective Thurston compactification](#); [Teichmüller space](#)

Full Text: [DOI](#) [EuDML](#)