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CENTRAL STRIPS OF SIBLING LEAVES IN LAMINATIONS OF THE UNIT DISK

DAVID J. COSPER, JEFFREY K. HOUGHTON, JOHN C. MAYER, LUKA MERNIK, AND JOSEPH W. OLSON

Abstract. Quadratic laminations of the unit disk were introduced by William P. Thurston as a vehicle for understanding the (connected) Julia sets of quadratic polynomials and the parameter space of quadratic polynomials. The Central Strip Lemma plays a key role in Thurston's classification of gaps in quadratic laminations and in describing the corresponding parameter space. We generalize the notion of "Central Strip" to laminations of all degrees $d \geq 2$ and prove a Central Strip Lemma for degree $d \geq 2$. We conclude with applications of the Central Strip Lemma to identity return polygons that show for higher degree laminations it may play a role similar to Thurston's lemma.

1. Introduction

Quadratic laminations of the unit disk were introduced by William P. Thurston as a vehicle for understanding the (connected) Julia sets of quadratic polynomials and the parameter space of quadratic polynomials. The Central Strip Lemma plays a key role in Thurston's classification of gaps in quadratic laminations [12]. It is used to show that there are no wandering polygons for the angle-doubling map σ_2 on the unit circle. Moreover, when a polygon returns to itself, the iteration of σ_2 is transitive on the vertices. For σ_2 it is sufficient to prove these facts for triangles: there are no wandering triangles, and no identity return triangles. From these facts, the classification of types of gaps of a quadratic lamination, and a parameter space for quadratic laminations, follows. Thurston posed

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