



Teichmüller Theory Seminar

Automorphisms and Primitive Curve Lengths on Pairs of Pants

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Abstract

The fundamental group of a pair of pants is a free group of rank two. A closed geodesic on a pair of pants is a principal primitive (a p -primitive for short) if it, together with one other such geodesic, generates the fundamental group. Every such primitive is the image of a simple curve under a conformal automorphism. Its essential self-intersections are those that self-intersections that occur along a seam of the pair of pants. The conjugacy class of a p -primitive is determined by a rational number, r with a continued fraction expansion whose entries give a formula for the number of essential self-intersections. These entries are computed using the Non-Euclidean Euclidean algorithm. We obtain a number of length inequalities including upper and lower bounds on the hyperbolic length of any such primitive in terms of the essential self-intersection numbers, variants on the upper and lower bounds for the translation length of any such primitive using the entries in the continued expansion and the translation length of the shortest curves (which the discreteness algorithm always finds) and we express the longest seam length as a limit involving the entries in r and hyperbolic distance. The results stem from casting the Gilman-Maskit discreteness algorithm as a Non-Euclidean Euclidean algorithm. Length inequalities, McShane type inequalities, and intersection and their relation to higher dimensional T-theory are currently the focus of much attention. Time permitting, we give an extension to hyperbolic three-space that is joint work with Keen.

Monday, 07 December 2015, 4pm

Smith Hall 204