

QUANTITATIVE UNIQUE ERGODICITY FOR RATIONAL POLYGONAL BILLIARDS

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A celebrated theorem of Kerckhoff-Masur-Smillie (Ann. Math. 1986) states that the straight line flow on every translation surface in almost every direction, in particular for those surfaces arising from rational polygonal billiards, is uniquely ergodic. In this talk we will sketch the proof of polynomial upper bounds for the deviation of ergodic averages of weakly differentiable functions. The proof is based on a spectral gap theorem, uniform on compact sets, for the so-called Kontsevich-Zorich cocycle over the Teichmüller flow on the moduli space of abelian differentials (translation surfaces) and on quantitative recurrence estimates for typical Teichmüller geodesics on every Teichmüller disk. This is joint work with J. S. Athreya (Princeton).