In this article, the author discusses the nonuniform hyperbolicity of the Kontsevich-Zorich cocycle with respect to the canonical absolutely continuous $\text{SL}(2, \mathbb{R})$-invariant probability measures on the connected components of the moduli space of abelian differentials on Riemann surfaces. This nonuniform hyperbolicity was proved by the author himself in an earlier work [Ann. of Math. (2) 155 (2002), no. 1, 1–103; MR1888794]. The nonuniform hyperbolicity of the Kontsevich-Zorich cocycle is important in several applications to the dynamics of translation flows and interval exchange transformations, such as the fine behavior of ergodic averages and their deviations. In this article, the author establishes a geometric criterion on a general $\text{SL}(2, \mathbb{R})$-invariant ergodic probability measure for the nonuniform hyperbolicity. The argument presented simplifies and generalizes the proof for the case of canonical measures given in [op. cit.].

There is an appendix written by C. Matheus that discusses a few relevant examples that further illustrate the power and the limitations of the geometric criterion given in the paper.

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References

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32. C. McMullen, Dynamics of \( SL_2(\mathbb{R}) \) over moduli space in genus two, Ann. of Math.

Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.