Citations From References: 13 From Reviews: 0

MR3225454 37D25 32G15 37D40
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Zero Lyapunov exponents of the Hodge bundle. (English summary)

Summary: “By the results of G. Forni and of R. Treviño, the Lyapunov spectrum of the Hodge bundle over the Teichmüller geodesic flow on the strata of Abelian and of quadratic differentials does not contain zeroes even though for certain invariant submanifolds zero exponents are present in the Lyapunov spectrum. In all previously known examples, the zero exponents correspond to those $\text{PSL}(2, \mathbb{R})$-invariant subbundles of the real Hodge bundle for which the monodromy of the Gauss-Manin connection acts by isometries of the Hodge metric. We present an example of an arithmetic Teichmüller curve, for which the real Hodge bundle does not contain any $\text{PSL}(2, \mathbb{R})$-invariant, subbundles, and nevertheless its spectrum of Lyapunov exponents contains zeroes. We describe the mechanism of this phenomenon; it covers the previously known situation as a particular case. Conjecturally, this is the only way zero exponents can appear in the Lyapunov spectrum of the Hodge bundle for any $\text{PSL}(2, \mathbb{R})$-invariant probability measure.”

References

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