

Spectral gap for the $SL(2,\mathbb{R})$ action in moduli space

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Abstract: We consider the Teichmüller flow in the unit cotangent bundle of the moduli space of (finite volume) Riemann surfaces. It is the diagonal flow of a natural $SL(2,\mathbb{R})$ action which preserves the canonical volume form, of finite volume. We show that the Teichmüller flow is exponential mixing for a convenient class of observables, which implies that the $SL(2,\mathbb{R})$ action has a spectral gap. This result is a particular case of a more general theorem (joint with Maria Joao Resende) showing the spectral gap for the restriction of the $SL(2,\mathbb{R})$ action to arbitrary "connected components of strata of quadratic differentials", which extends earlier work (joint with Sebastien Gouezel and Jean-Christophe Yoccoz) about strata of squares.