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Spencer Dowdall*, Vanderbilt University, 1326 Stevenson Center, Nashville, TN 37240, and
Grace Work. *Discretely shrinking targets in moduli space.*

Given a decreasing family $B_1 \supset B_2 \supset \dots$ of targets in a measure space X equipped with a flow φ_t (or transformation), the ‘shrinking target problem’ asks to characterize when there is a full measure set of points x that hit the targets infinitely often in the sense that $\{n \in \mathbb{N} \mid \varphi_n(x) \in B_n\}$ is unbounded.

This talk will examine the discrete shrinking target problem for the Teichmüller geodesic flow on the moduli space of unit-area quadratic differentials. Specifically, for any nested sequence of measurable sets B_i in the moduli space of Riemann surfaces with preimages E_i in quadratic differential space, consider the set \mathcal{H} of unit-area quadratic differentials that hit the targets E_i infinitely often. We show that for any ergodic $\mathrm{SL}(2, \mathbb{R})$ -invariant probability measure μ , the set \mathcal{H} has zero measure if $\{\mu(E_i)\}$ is summable and otherwise has full measure. As an application, we obtain ‘logarithm laws’ describing how quickly a generic trajectory $\{\varphi_n(q) \mid n \in \mathbb{N}\}$ accumulates on a given point. (Received August 20, 2019)