

Minsky, Yair N.

Quasi-projections in Teichmüller space. (English) Zbl 0848.30031

J. Reine Angew. Math. 473, 121-136 (1996).

Let $\mathcal{T}(S)$ be the Teichmüller space of a surface S of finite type and d the Teichmüller metric on $\mathcal{T}(S)$. For a closed geodesic L the closest-point-projection $\pi_L : \mathcal{T}(S) \rightarrow \mathcal{P}(L)$ is defined by

$$\pi_L(\sigma) := \{\alpha \in L; d(\sigma, \alpha) = d(L, \sigma)\}.$$

It is shown that for all $\varepsilon > 0$ there is a constant b such that

$$\text{diam}\left(\bigcup\{\pi_L(\alpha); d(\alpha, \sigma) < d(\sigma, L)\}\right) \leq b$$

for all ε -precompact geodesics L and all $\sigma \in \mathcal{T}(S)$.

Conversely, if L is a non-precompact geodesic, then this contraction property does not hold for any b .

The author also gives some consequences of the contraction theorem which are directly analogous to well-known properties of hyperbolic space.

Reviewer: [S.Timmann \(Hannover\)](#)

MSC:

30F60 Teichmüller theory for Riemann surfaces

Cited in **22** Documents

Keywords:

geodesics; Teichmüller space; contraction

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