

Info

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Thick-think decomposition of hyperbolic 3-manifolds

(Margulis lemma) There exists a constant $r_0 > 0$ such that for any Kleinian group Γ and any $p \in \mathbb{R}H^3$

$$\langle \{\gamma \in \Gamma | d(p, \gamma(p)) < r_0\} \rangle$$

is an elementary group.

 [John Hamal Hubbard - Teichmüller Theory and Applications - Volume 3, p.65](#)

thin parts

 **Definition.** Thick and thin parts of a hyperbolic manifold

Let $\epsilon > 0$ and M be a hyperbolic manifold. Then the ϵ -**thin** part of M is the open subset

$$M^\epsilon := \{p \in M | \exists \text{ a nontrivial loop } \gamma \text{ based at } p : l(\gamma) < \epsilon\}$$

The complement $M \setminus M^\epsilon$ is the ϵ -**thick** part of M .

	model in H^3_U
collar around rank 1 cusp	$A_\epsilon := \left\{ (z, t) \in \mathbb{C} \times (0, \infty) \middle t > \frac{1}{2 \sin(\epsilon/2)} \right\}$
collar around rank 2 cusp	quotient of A_ϵ by $z \mapsto z + 1$ and $z \mapsto z + \tau$
collar around short geodesic	$\frac{\left\{ (z, t) \in \mathbb{C} \times (0, \infty) \middle \frac{ z }{t} < c \right\}}{(z, t) \sim (\lambda z, \lambda t)}$ for some $c \in \mathbb{R}, \lambda \in \mathbb{C}$ such that $\lambda > 1$ and $\log \lambda < \epsilon$

The connected components of M^ϵ are isometric to one of

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for $\epsilon < r_0$ where r_0 is the constant in

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Current note has 0 direct children and 0 total descendants.

- stem

• [Objects stemming from \$PSL\(2\)\(\mathbb{C}\)\$](#)

• [Kleinian groups \$\Gamma <_d PSL\(2\)\(\mathbb{C}\) \leftrightarrow\$ Hyperbolic 3-manifolds/orbifolds \$\Gamma \backslash \mathbb{R}H^3\$](#)

• [Thick-think decomposition of hyperbolic 3-manifolds](#)
- And it has 7 siblings.
- stem

• [Objects stemming from \$PSL\(2\)\(\mathbb{C}\)\$](#)

• [Kleinian groups \$\Gamma <_d PSL\(2\)\(\mathbb{C}\) \leftrightarrow\$ Hyperbolic 3-manifolds/orbifolds \$\Gamma \backslash \mathbb{R}H^3\$](#)

• [Finitely generated, free Kleinian groups](#)

• [2-generated Kleinian groups](#)

• [Finitely generated Kleinian groups \$\leftrightarrow\$ topologically tame oriented hyperbolic 3-manifolds/finite degree orbifold covers of](#)

• [Building hyperbolic 3-manifolds by gluing polyhedra](#)

• [Kleinian group with \$\Lambda\(\Gamma\) \neq \partial \mathbb{R}H^3\$](#)

• [Thick-think decomposition of hyperbolic 3-manifolds](#)

• [Kleinian ultra-Schottky groups \$\leftrightarrow\$ convex cocompact hyperbolic interior of 3-handlebodies](#)