Curvature Bounds for Surfaces in Hyperbolic 3-Manifolds

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Abstract. A triangulation of a hyperbolic 3-manifold is \( L \)-thick if each tetrahedron having all vertices in the thick part of \( M \) is \( L \)-bilipschitz diffeomorphic to the standard Euclidean tetrahedron. We show that there exists a fixed constant \( L \) such that every complete hyperbolic 3-manifold has an \( L \)-thick geodesic triangulation. We use this to prove the existence of universal bounds on the principal curvatures of \( \pi_1 \)-injective surfaces and strongly irreducible Heegaard surfaces in hyperbolic 3-manifolds.

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