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Recent Results in the Geometry of Kleinian Groups

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Abstract. A *spherical point* of a Kleinian group Γ is a point of \mathbb{H}^3 that is stabilized by a spherical triangle subgroup of Γ . Such points appear as vertices in the singular graph of the quotient hyperbolic 3-orbifold. We announce here sharp lower bounds for the hyperbolic distances between such points in \mathbb{H}^3 . These bound from below the edge lengths of the singular graph. An elliptic element of a Kleinian group is *simple* if the translates of its axis under the group Γ form a disjoint collection of hyperbolic lines. Here we announce that the minimal covolume Kleinian group contains no simple elliptics of order $p \geq 3$.

Applications of these estimates leads to sharp volume bounds for hyperbolic 3-orbifolds whose singular set contains a spherical point. We are also able to present substantial progress to the problem of identifying the minimal covolume Kleinian group.

Keywords. Kleinian group, discrete group, hyperbolic geometry, hyperbolic volume.

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