

Addition of geometric volume classes

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Abstract: We study the algebraic structure of three dimensional bounded cohomology generated by volume classes for infinite co-volume, finitely generated Kleinian groups. While bounded cohomology is generally unwieldy, we show that addition admits a natural geometric interpretation for the volume classes of tame hyperbolic manifolds of infinite volume and bounded geometry: the volume classes of singly degenerate manifolds sum to the volume classes for manifolds with many degenerate ends. It turns out that this generates the linear dependencies among certain geometric classes, giving a complete description of the algebraic structure of some geometrically defined subspaces of bounded cohomology.

We will indicate some problems left open by this discussion and give some suggestions for future directions. Definitions, background, and geometric aspects of hyperbolic manifolds homotopy equivalent to a closed surface will be introduced as needed during the talk. We will assume some familiarity with Gromov hyperbolic metric spaces.