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The Volume of Complete Anti-de Sitter 3-Manifolds

Up to a finite cover, closed anti-de Sitter 3-manifolds are quotients of $SO_0(2, 1)$ by a discrete subgroup of $SO_0(2, 1) \times SO_0(2, 1)$ of the form $j \times \rho(\Gamma)$, where Γ is the fundamental group of a closed oriented surface, j a Fuchsian representation and ρ another representation which is “strictly dominated” by j .

Here we prove that the volume of such a quotient is proportional to the sum of the Euler classes of j and ρ . As a consequence, we obtain that this volume is constant under deformation of the anti-de Sitter structure. Our results extend to (not necessarily compact) quotients of $SO_0(n, 1)$ by a “geometrically finite” subgroup of $SO_0(n, 1) \times SO_0(n, 1)$.

Keywords: Anti-de Sitter, (G, X) -structures, Clifford-Klein forms, volume of 3-manifolds.

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