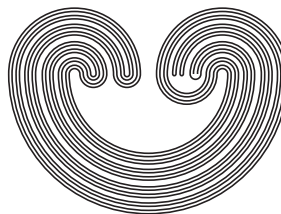


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NEGATIVELY CURVED CODIMENSION ONE DISTRIBUTIONS

by

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NEGATIVELY CURVED CODIMENSION ONE DISTRIBUTIONS

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ABSTRACT. We consider finite volume manifold pairs (M, N) modeled on $(\mathbb{C}\mathbb{H}^n, \mathbb{C}\mathbb{H}^{n-2})$ and prove the existence of a special Riemannian metric g on $M \setminus N$. This metric g is complete, has finite volume, and is negatively curved when restricted to a specific non-integrable codimension one distribution \mathcal{D} . The existence of this metric g shows that some recent results by Grigori Avramidi and T. Tam Nguyen Phan [*Half dimensional collapse of ends of manifolds of nonpositive curvature*. To appear in *Geom. Funct. Anal.*] cannot, in some sense, be extended to distributions on manifolds.

1. INTRODUCTION

Let $\mathbb{C}\mathbb{H}^n$ denote n -dimensional complex hyperbolic space. If M is a Riemannian manifold and N a totally geodesic submanifold of M , we say that the pair (M, N) is *modeled on* $(\mathbb{C}\mathbb{H}^n, \mathbb{C}\mathbb{H}^k)$ if there exist lattices $\Gamma \subset \text{Isom}(\mathbb{C}\mathbb{H}^n)$ and $\Lambda \subset \text{Isom}(\mathbb{C}\mathbb{H}^k)$ such that $M = \mathbb{C}\mathbb{H}^n/\Gamma$, $N = \mathbb{C}\mathbb{H}^k/\Lambda$, and $\Lambda < \Gamma$. We also allow for the possibility that N is disconnected. That is, we allow for multiple lattices $\Lambda < \Gamma$ which correspond to different (disjoint) copies of $\mathbb{C}\mathbb{H}^k \subset \mathbb{C}\mathbb{H}^n$. The main result of this paper is the existence of a special metric on $M \setminus N$ when $k = n - 2$ (that is, when N has real codimension 4).

Theorem 1.1. *Suppose (M, N) is modeled on $(\mathbb{C}\mathbb{H}^n, \mathbb{C}\mathbb{H}^{n-2})$ with M having finite volume. Then there exists a Riemannian metric g on $M \setminus$*

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