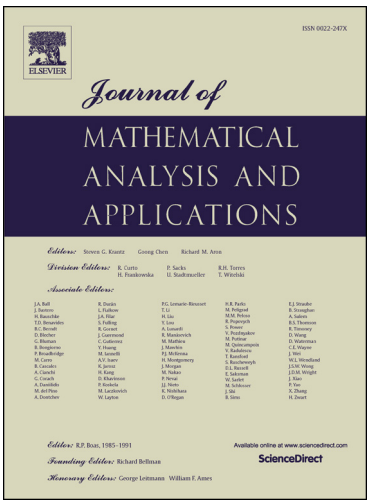
Accepted Manuscript



Flow of pinched convex hypersurfaces by powers of curvature functions in Hyperbolic space

Guanghan Li, Yusha Lv

PII: S0022-247X(17)31112-5
DOI: https://doi.org/10.1016/j.jmaa.2017.12.034
Reference: YJMAA 21895

To appear in: *Journal of Mathematical Analysis and Applications*

Received date: 7 April 2017

Please cite this article in press as: G. Li, Y. Lv, Flow of pinched convex hypersurfaces by powers of curvature functions in Hyperbolic space, *J. Math. Anal. Appl.* (2018), https://doi.org/10.1016/j.jmaa.2017.12.034

Flow of pinched convex hypersurfaces by powers of curvature functions in Hyperbolic space☆

Guanghan Li

School of Mathematics and Statistics, Wuhan University, Wuhan 430072, China

Yusha Lv*

School of Mathematics and Statistics, Wuhan University, Wuhan 430072, China

Abstract

This paper concerns closed, h-convex hypersurfaces of dimension $n \geq 2$ in the hyperbolic space $\mathbb{H}^{n+1}_{\kappa}$ of constant sectional curvature κ evolving in direction of its normal vector, where the speed equals a power $\beta > 1$ of a curvature function F, which is monotone, symmetric, homogeneous of degree 1. It is shown that if the initial h-convex hypersurface is pinched, then this is maintained under the flow, and the hypersurfaces shrink to a round point in $\mathbb{H}^{n+1}_{\kappa}$ in finite time. As a consequence, when rescaling appropriately, the evolving hypersurfaces converge smoothly and exponentially to the unit sphere of $\mathbb{R}^{n+1}$.

Keywords: curvature flow, h-convex hypersurface, hyperbolic space

2010 MSC: 53C44, 35K55

1. Introduction

This paper consider the following problem. Let M^n be a smooth, compact oriented Riemannian manifold of dimension $n(\geq 2)$ without boundary, $(N^{n+1}, \bar{g})$ be an $(n+1)$-dimensional complete Riemannian manifold, and $X_0 : M^n \to N^{n+1}$ a smooth immersion. We consider a one-parameter family of smooth immersions

*Corresponding author

Email addresses: ghli@whu.edu.cn (Guanghan Li), lvyushasx@163.com (Yusha Lv)