Ann. Acad. Rom. Sci.
Ser. Math. Appl.
ISSN 2066-6594 Vol. 13, No. 1-2/2021

EVOLUTION OF CONVEX HYPERSURFACES BY A FULLY NONLINEAR MIXED VOLUME PRESERVING CURVATURE FLOW*

Ghodrat Moazzaf† Esmaiel Abedi‡

Abstract

In this paper we study the evolution of closed convex hypersurfaces under the mixed volume preserving curvature flow in Euclidean space with the speed given by reversed function that is symmetric and homogeneous of degree one. We prove that the hypersurfaces preserve convexity under the flow, the maximum existence time is infinite and the hypersurfaces asymptotically approach to sphere.

MSC: 53C44
DOI https://doi.org/10.56082/annalsarscimath.2021.1-2.93
keywords: Fully nonlinear Curvature flow, Maximum principle.

1 Introduction

Let M_0 be a smooth, strictly convex hypersurface without boundary. Suppose M_0 is given by a smooth embedding $X_0 : \mathbb{S}^n \to M_0 \subset \mathbb{R}^{n+1}$. Let $X_t = X(., t)$ evolving according to

$$\begin{aligned} &\frac{\partial}{\partial t}X(x,t) = k(x,t)\nu(x,t) \\ &X(x,0) = X_0(x) \end{aligned} \tag{1}$$

*Accepted for publication on July 14-th, 2020

†gh.moazzaf@azaruniv.edu Faculty of Science, Azarbaijan Shahid Madani University, Tabriz, Iran

‡esabedi@azaruniv.ac.ir Faculty of Science, Azarbaijan Shahid Madani University, Tabriz, Iran