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

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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

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

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

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