Convexity estimates for flows by powers of the mean curvature

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With an appendix by Felix Schulze and Oliver C. Schnürer

Abstract. We study the evolution of a closed, convex hypersurface in $\mathbb{R}^{n+1}$ in direction of its normal vector, where the speed equals a power $k \geqslant 1$ of the mean curvature. We show that if initially the ratio of the biggest and smallest principal curvatures at every point is close enough to 1, depending only on k and n, then this is maintained under the flow. As a consequence we obtain that, when rescaling appropriately as the flow contracts to a point, the evolving surfaces converge to the unit sphere.