

Self-similar solutions of fully nonlinear curvature flows

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Abstract. We consider closed hypersurfaces which shrink self-similarly under a natural class of fully nonlinear curvature flows. For those flows in our class with speeds homogeneous of degree 1 and either convex or concave, we show that the only such hypersurfaces are shrinking spheres. In the setting of convex hypersurfaces, we show under a weaker second derivative condition on the speed that again only shrinking spheres are possible. For surfaces this result is extended in some cases by a different method to speeds of homogeneity greater than 1. Finally we show that self-similar hypersurfaces with sufficiently pinched principal curvatures, depending on the flow speed, are again necessarily spheres.

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