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Volume-preserving Mean Curvature Flow in the Hyperbolic Space (and beyond)

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Abstract

We consider the Hyperbolic space as the ambient setting to prove: if we have a compact hypersurface, convex by horospheres and evolving by the Volume-preserving Mean Curvature Flow (VPMCF), then it flows for all time, convexity by horospheres is preserved and the flow converges, exponentially, to a geodesic sphere. In addition, we show that the same conclusions about long time existence and convergence hold if the initial condition is not convex by horospheres but it is close enough to a geodesic sphere.

We also describe some results on the VPMCF in a Rotationally Symmetric Space (which include the Hyperbolic and Euclidean spaces) of revolution hypersurfaces generated by a graph over the axis of revolution and with boundary in two totally geodesic hypersurfaces.