Computation of Self-Similar Solutions for Mean Curvature Flow

David L. Chopp

Abstract

We describe a numerical algorithm to compute surfaces that are approximately self-similar under mean curvature flow. The method restricts computation to a two-dimensional subspace of the space of embedded manifolds that is likely to contain a self-similar solution.

Using the algorithm, we recover the self-similar torus of Angenent and find several surfaces that appear to approximate previously unknown self-similar surfaces. Two of them may prove to be counterexamples to the conjecture of uniqueness of the weak solution for mean curvature flow for surfaces.