EXISTENCE OF HELICOIDAL TRANSLATING SOLITONS FOR THE MEAN CURVATURE FLOW AND THEIR ASYMPTOTIC BEHAVIOR

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The mean curvature flow (MCF) is the negative gradient flow of the area functional. It is well known that any closed (hyper)surface flows occurs singularities in finite time under MCF. There are parabolic rescaling models of type I and type II singularities as special solutions which are the self-similar solution and translating soliton, respectively. Translating soliton is a solution moving in a constant direction without deforming its shape under MCF. Halldorsson [3] proved the existence of the helicoidal rotating soliton under MCF which is equivalent to the helicoidal translating soliton with translating direction parallels to the axis of rotation under MCF. Firstly, we construct complete translating solitons invariant under the helicoidal motions, which are helicoidal translating solitons, by analyzing an associated dynamical system using a suitable coordinate transformation which is deformed the transformation used in [1, 2] and also classify the profile curves. Secondly, we investigate the asymptotic behavior of the profile curves from the coordinate transformation.

REFERENCES