Hiroshima Mathematical Analysis Seminar No.46

Stability of traveling curved fronts in a curvature flow with driving force

This is a joint work with H. Ninomiya of Ryukoku University. We are concerned with asymptotical stability of traveling curved fronts to a mean curvature flow with a constant driving force term in the two-dimensional Euclidean space. Our first result shows that, if a suitable bounded perturbation is added to a traveling curved front, it does not recover its shape at any positive time. This fact implies that boundedness of given perturbations is not enough for asymptotical stability. Then we prove that, if a given bounded perturbation decays at infinity, the perturbed traveling curved fronts always recover their shapes as time goes on. This fact holds true for any large perturbation if it decays at infinity.

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