

Backwards Uniqueness and Rates of Singularity Formation in Mean Curvature Flow

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Abstract

The question of backwards uniqueness for parabolic PDE asks whether the same final state can be reached via the flow starting from two different sets of initial data. Backwards uniqueness is a far more subtle property compared to standard uniqueness but gives insight into the fine structure of solutions and singularity formation. I will discuss two recent results concerning the comparative rate of singularity formation in closed Mean Curvature Flows:

- For flows with a compact singularity, we show that two flows cannot approach each other faster than polynomially, extending a result of Martin-Hagemayer–Sesum.
- For isolated conical singularities, we show backwards uniqueness by first proving a backwards uniqueness theorem assuming a rate of convergence and then show that this rate is always saturated by two flows that agree on the singular time slice.

This talk is based on joint work with Or Hershkovits.