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Global existence of weak solution for volume preserving mean curvature flow via phase field method

In this talk, we consider the phase field method for the volume preserving mean curvature flow. Given an C^1 hypersurface, we prove the global existence of the weak solution for the volume preserving mean curvature flow via the reaction diffusion equation with a non-local term. In particular, we show the L^2 -boundedness of the mean curvature which is the key estimate to prove the main theorem. In addition, we prove the monotonicity formula for the reaction diffusion equation.