Optimal rate of convergence of the Allen-Cahn equation to the motion by mean curvature

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Abstract: We consider the initial value problem for the Allen-Cahn equation. This problem can be regarded as an approximation of the motion of a hypersurface by its mean curvature. In this talk we derive a rate of convergence for the motion of a smooth and compact hypersurface by its mean curvature. We also consider the special case of a circle evolving by its curvature and show that our rate is optimal.