

Singular limit of the weighted Allen-Cahn equation

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We consider a weighted Allen-Cahn equation with a positive potential $K(x)$.

Formally, the equation corresponds to a gradient flow of the weighted area functional, that is, the mean curvature flow with transport term $-\nabla^\perp K/(2K)$.

In 2018, Qi-Zheng proved that the Allen-Cahn equation converges to the gradient flow in the sense of Brakke when $K \in C^2(\overline{\Omega})$.

We partially extend the results for $K \in W^{2,p}(\Omega)$ where $p > n/2$.

In addition, we explain the monotonicity formula and related estimates for the Allen-Cahn equation.

This talk is based on a joint work with Hiroki Harashima (TAIJU LIFE INSURANCE COMPANY LIMITED).