

Strong Nonlocal-to-Local Convergence of the Cahn–Hilliard Equation and its Operator

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We prove convergence of a sequence of weak solutions of the nonlocal Cahn-Hilliard equation to the strong solution of the corresponding local Cahn-Hilliard equation. The analysis is done in the case of sufficiently smooth bounded domains with Neumann boundary condition and a $W^{1,1}$ -kernel. The proof is based on the relative entropy method. Additionally, we prove the strong L^2 -convergence of the nonlocal operator to the negative Laplacian together with a rate of convergence.

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