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Stephane Kirsch* (kirsch@ann.jussieu.fr), Laboratoire Jacques-Louis Lions, 175 rue du chevaleret, bureau 2D01, 75013 Paris, France. *Convergence of a modified Allen-Cahn equation to a prescribed mean curvature problem.*

We study the following Allen-Cahn functional for $u \in H^1 \cap L^4$:

$$E_\varepsilon(u) = \int_{T^N} \varepsilon \frac{|\nabla u|^2}{2} + \frac{W(u)}{\varepsilon} - \mathcal{H}u, \quad (1)$$

where T^N is a flat torus, W a double-well potential vanishing for 0 and 1, and \mathcal{H} a positive and Lipschitz function.

First we prove that at the limit $\varepsilon \rightarrow 0$ (up to subsequences), critical points of E_ε converge to a function $u_\infty \in BV(T^N, \{0, 1\})$ and the mean curvature of the interface between 0 and 1 is strongly related to \mathcal{H} .

Secondly we prove that E_ε admits saddle critical points and we give some energy estimates, depending on the function \mathcal{H} . (Received July 19, 2007)