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Errata to "Asymptotic Behaviour of Solutions to Phase Field Models with Constraints" in Volumo 39

By

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In condition (q2) of Section 3 we have to assume further that

(1) $q''(u^{\infty};\cdot)$ is not identically zero in any neighbourhood of ζ_0.

In fact, if $q''\equiv 0$ on an interval $[\zeta_0-\delta,\zeta_0+\delta],\delta>0$, then

(2) $$I(b)=\frac{2^{1/2}\pi}{|q'(u^{\infty};\zeta_0)|^{1/2}}=:I_0 \text{ for all } b\in[b_1,0],$$

where $[b_1,0]$ is the largest interval on which $I=I_0$; note that $b_*(u^{\infty})\le b_1<0$. In this case, the set $S(b_1):=\{cW_0+\zeta_0; c\in[\eta_-(b_1)-\zeta_0,\eta_+(b_1)-\zeta_0]\}$, with

$$W_0(x):=\cos\frac{|q'(u^{\infty};\zeta_0)|^{1/2}(x+L)}{\kappa^{1/2}},$$

is a subset of S^*, if $2LI_0^{-1}(\kappa/2)^{-1/2}=:k_0$ is positive integer. Moreover, S_0 is no longer finite and can be decomposed as $S_0=S_0^{(1)}+S_0^{(2)}$, where $S_0^{(1)}$ is a (finite) set included in $\tilde{S}_0$ and

$$S_0^{(2)}=S(b_1)-\{cW_0+\zeta_0; c=0,\eta_-(b_*(u^{\infty}))-\zeta_0,\eta_+(b_*(u^{\infty}))-\zeta_0\}.$$

Consequently we observe:

(a) Under a further assumption (1), $S_0^{(2)}=\varnothing$ and hence all the statements and results mentioned in the paper hold true without any change.

(b) In the case when (1) is not satisfied, we have (2) and if k_0 is positive integer, then the set $S(b_1)$ possibly forms one ω-limit set of the order parameter ω. If k_0 is not a positive integer, then $S(b_1)$ contains no stationary solutions of $P(\sigma_*,\sigma^*;u^{\infty})$; namely $S_0^{(2)}=\varnothing$.

For a class of parabolic equations with obstacle (of the Alen-Cahn type), the stability of stationary problems was investigated in detail by X. Chen and C. M. Elliott (Proc. Roy. Soc. London Ser. A, 444 (1994), 429–445), when $q(u^{\infty};v)=-v$ (hence (1) dose not hold); in this case, any non-constant stationary solution belongs to similar classes to $S_0^{(2)}$ or S_1. But, so far as the stability is concerned, our case is quite different from theirs, since the model is a couple of two parabolic equations (see a forthcoming paper of the authors, Tech. Reports Math. Sci., Chiba Univ., 1997).

nuna adreso:

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