Rigorous Derivation of Reaction-Diffusion Equations with Fluctuations. A. DE MASI, P. A. FERRARI, and J. L. LEBOWITZ [Phys. Rev. Lett. 55, 1947 (1985)].

On page 1947, in the right-hand column, line 25 should read, ". . . exchange, $\sigma \rightarrow \sigma^{x,y}$, with . . . ." The opening curly parenthesis in Eq. (1) should be deleted.

On page 1948, in the left-hand column, the sentence beginning in line 6 should read, "Let $\Lambda_{\mathbf{r}}^{\delta}$ be a cubical box with sides of length δ, centered on $\mathbf{r} \in R^d$." Line 20 should read, ". . . magnetization density at . . . ." In line 27, $\Lambda_{\mathbf{r}}^{\delta}$ should read $\epsilon^{-d}\Lambda_{\mathbf{r}}^{\delta}$. In line 29, $m(\mathbf{r},t)$ should be deleted.

On page 1948, in the right-hand column, line 1 should read, "$\rightarrow \int_{\Lambda_{\mathbf{r}}^{\delta}} m(\mathbf{r}',t)d^dr'$, a . . . ." The sentence containing Eq. (5) should begin, "For the example in (1) we have . . . ."

We alter the discussion of Theorem 2 for clarity. The text should be replaced by the following:

Theorem 2.—Let

$$\phi^{\epsilon}(\mathbf{r},t;\sigma) = \epsilon^{-d/2}[m^{\epsilon}(\mathbf{r}',t;\sigma) - \int_{\Lambda_{\mathbf{r}}^{\delta}} m(\mathbf{r}',t)d^dr'];$$

then

$$\phi^{\epsilon}(\mathbf{r},t;\sigma) \underset{\epsilon\rightarrow 0}{\rightarrow} \int \phi(\mathbf{r}',t)d^dr',$$

a random Gaussian field satisfying the following Ornstein-Uhlenbeck–type stochastic equation:

$$\frac{\partial\phi(\mathbf{r},t)}{\partial t} = \nabla^2\phi + F'(m(\mathbf{r},t))\phi + H(\mathbf{r},t), \tag{6}$$

where $H(\mathbf{r},t)$ is "white" noise with the covariance

$$\langle H(\mathbf{r},t)H(\mathbf{r}',t')\rangle = \delta(t-t')\{2\nabla_{\mathbf{r}}\cdot\nabla_{\mathbf{r}'}[(1-m^2)\delta(\mathbf{r}-\mathbf{r}')] + 4f(m)\delta(\mathbf{r}-\mathbf{r}')\}, \tag{7}$$

where $f(m) = \langle c(0;\sigma)\rangle_{\nu_m} [=1-\gamma(2-\gamma)m^2$, for example (1)].

The equal-time correlations of the fluctuation field ϕ,

$$c(\mathbf{r},\mathbf{r}';t) = \langle\phi(\mathbf{r},t)\phi(\mathbf{r}',t)\rangle,$$

satisfy the following equations:

$$c(\mathbf{r},\mathbf{r}';t) = [1-m^2(\mathbf{r},t)]\delta(\mathbf{r}-\mathbf{r}') + \tilde{c}(\mathbf{r},\mathbf{r}';t), \quad \tilde{c}(\mathbf{r},\mathbf{r}',)=0, \tag{8}$$

$$\partial\tilde{c}(\mathbf{r},\mathbf{r}';t)/\partial t = [\nabla_{\mathbf{r}}^2 + \nabla_{\mathbf{r}'}^2 + F'(m(\mathbf{r},t)) + F'(m(\mathbf{r}',t))]\tilde{c}(\mathbf{r},\mathbf{r}';t) - 2\delta(\mathbf{r}-\mathbf{r}')[(\nabla m)^2 - F'(m)(1-m^2) + mF(m) - 2f(m)], \tag{9}$$

The proof of these theorems uses a dual branching process; cf. Liggett,[2] Sect. 3, for a clear presentation of duality. This reduces. . . .

On page 1949, in line 17 of the first column, $|m(q,t)|$ should read $|m(\mathbf{r},t)|$. The equations on page 1949 should be replaced by

$$\partial\tilde{c}/\partial t = -4(1-2\gamma)\tilde{c} + 8\gamma\delta(\mathbf{r}-\mathbf{r}') + 2\nabla^2\tilde{c}, \quad \tilde{c}(r,r';0)=0, \tag{10}$$

and the solution is

$$\tilde{c}(\mathbf{r},\mathbf{r}';t) = 8\gamma\int_0^t ds\,(8\pi s)^{-1/2}\exp[-(\mathbf{r}-\mathbf{r}')^2/8s]\exp[-4(1-2\gamma)s]. \tag{11}$$

For $\gamma > \gamma_c$, $\tilde{c}_t \rightarrow \infty$ as $t\rightarrow\infty$, the growth being like $\sqrt{t}$ for γ_c and exponential for $\gamma > \gamma_c$, while for $\gamma < \gamma_c$,

$$\tilde{c}(\mathbf{r},\mathbf{r}';t) \rightarrow \frac{\gamma}{(\gamma_c-\gamma)^{1/2}}\exp[-2(\gamma_c-\gamma)^{1/2}|\mathbf{r}-\mathbf{r}'|] \tag{12}$$