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Erratum: Phase Structure of Two-Dimensional Spin Models and Percolation[1]

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We forgot to impose the following restriction on the nearest neighbor coupling function $h(S \cdot S')$: h has to be ferromagnetic in the sense of being a monotonically nondecreasing function of its argument. This makes the induced Ising model ferromagnetic and is also necessary for the conclusion that the 'reduced hemispherical clusters' (see eq. (15)) are contained in the FK clusters. With this condition, which is in fact fulfilled for the relevant models (such as the standard action $h(t) = -t$ with a Lipschitz constraint) all conclusions of the paper remain unchanged.

Nevertheless let us remark that a FK representation is also possible without this condition. But for a general coupling function h the definition of the bond activation probability (eq. (10')) has to be changed in the following way: Let ω_{xy} be the sign of the induced coupling of the Ising spins σ_x and σ_y, given a spin configuration. More explicitly:

$$\omega_{xy} = \operatorname{sgn}\{-h(|S(x)_{||}\, S(y)_{||}| + S(x)_{\perp}\, S(y)_{\perp}) + h(-|S(x)_{||}\, S(y)_{||}| + S(x)_{\perp}\, S(y)_{\perp})\}$$

Then in eq. (10') the symbol $\delta_{\sigma_x \sigma_y}$ has to be changed to $\delta_{\sigma_x, \omega_{xy}\sigma_y}$. Finally, eq. (10') contains a misprint at the end: The scalar product $S(x) \cdot S(x)$ should be $S(x) \cdot S(y)$. So all in all, eq. (10') should then read

$$P(\{n_{xy}\}, \{S(x)\}) = Z_A^{-1} \prod_{\langle xy \rangle} \{\delta_{\sigma_x, \omega_{xy}\sigma_y}[n_{xy}\, p_{xy} + (1 - n_{xy})(1 - p_{xy})] + (1 - \delta_{\sigma_x, \omega_{xy}\sigma_y})(1 - n_{xy})\} \prod_{\langle xy \rangle} e^{\beta S(x) \cdot S(y)}$$

Another remark concerns our ergodicity assumption (Conjecture 1). It can be weakend as follows: if suffices to assume that each ergodic component of the Gibbs measure is invariant under the symmetry group $O(N)$.

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