Erratum to

Phase Transitions on Nonamenable Graphs

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by Russell Lyons

On p. 1113, the proof of tail triviality appearing after the proof of Proposition 5.2 is incorrect. The electronic version of the paper on my homepage has a correct proof, which is reproduced here:

To see this, let B be any increasing cylinder event and let A be any tail event. Let G be exhausted by the finite subgraphs G_n. Suppose that n is large enough that B depends on the edges in G_n only. Given $M > n$, approximate A by a cylinder event C depending only on edges in $G_M \setminus G_n$. Let D denote the event that all edges in $G_M \setminus G_n$ are closed. Then

$$\mathsf{RC}^{G_n}(B) = \mathsf{RC}^{G_M}(B \mid D) \le \mathsf{RC}^{G_M}(B \mid C)\,,$$

because RC has positive correlations. Letting $M \to \infty$ shows that $\mathsf{RC}^{G_n}(B) \le \mathsf{FRC}(B \mid C)$, whence $\mathsf{RC}^{G_n}(B) \le \mathsf{FRC}(B \mid A)$. Now let $n \to \infty$ to conclude that $\mathsf{FRC}(B) \le \mathsf{FRC}(B \mid A)$. Since the same holds with $\neg A$ in place of A, this inequality is, in fact, an equality. That is, A is independent of every increasing cylinder event, whence of every cylinder event, whence of every event. In other words, A is trivial. To prove tail triviality for WRC, we use the same proof with G_n^* in place of G_n, with D being the event that all edges in $G_M^* \setminus G_n^*$ are open, and with reversed inequalities.

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