Erratum to "The Bohman-Frieze process near criticality"

Kang, Perkins, and Spencer
The Bohman-Frieze process near criticality, Random Structures & Algorithms, Vol. 43, No. 2, pp. 221–250, September 2013

DOI 10.1002/rsa.20588

We regret that the paper *The Bohman-Frieze process near criticality* which appeared in *Random Structures & Algorithms*, Volume 43, Issue 2, pages 221–250, September 2013 contains a serious gap in the proof of Theorem 3. More precisely, the analysis of the existence and properties of the solution ρ of the partial differential equation in Section 6.2.4. is not correct. The error began with (52) which influenced the entire analysis thereafter in Section 6.2.4.

As a consequence, Theorem 4, Proposition 2, Proposition 4 of the paper are proved under the assumption that the following conjecture is true for the barely subcritical case. The rest of the paper is valid as published.

Conjecture 1. *Let $x_i(t)$ be the solution of the following ODE's*

$$\begin{aligned} x_1'(t) &= -x_1(t) - x_1^2(t) + x_1^3(t), \\ x_2'(t) &= 2x_1^2(t) - x_1^4(t) - 2(1 - x_1^2(t))x_2(t), \\ x_i'(t) &= \frac{i}{2}(1 - x_1^2(t)) \sum\nolimits_{k<i} x_k(t)x_{i-k}(t) - i(1 - x_1^2(t))x_i(t), \quad i \geq 2, \end{aligned}$$

and t_c denote the critical time for the appearance of the giant component. Let $I = [t_0, t_1]$ be any bounded interval with $t_0 > 0$. Then there exist continuous functions $c(t)$ and $d(t)$ on I which are strictly positive except that $d(t_c) = 0$, such that

$$x_i(t) \;=\; c(t)\, i^{-3/2}\, e^{-d(t)i}\, (1 + O(1/i)),$$

for all $t \in I$ and $i \geq 1$. Moreover, there exist positive constants c_0, d_0 such that $c(t_c \pm \epsilon) = c_0 + O(\epsilon)$ and $d(t_c \pm \epsilon) = \epsilon^2 d_0 + O(\epsilon^3)$ for any $\epsilon > 0$.

Riordan and Warnke have recently proved Conjecture 1 for some interval containing t_c, as well as an analogue for any bounded-size rule [1].

REFERENCE

[1] Personal communication.

© 2015 Wiley Periodicals, Inc.