1009-05-114 **Jozsef Balogh*** (jobal@math.ohio-state.edu), Department of Mathematics, University of Illinois at Urbana-Champaign, Urbana, IL 61801, and **Boris Pittel** and **Gelasio Salazar**.

Non-crossing matchings and paths in randomly labeled planar point sets.

Consider a set S of points in the plane in general position, where each point has an integer label from $\{0, 1, \ldots, n-1\}$. This naturally induces a labeling of the edges: each edge (i, j) is assigned label $i+j$, modulo n. In the spirit of harmonious graphs, we propose the algorithms for finding (hopefully) large non–crossing, pseudoharmonious matchings or paths, i. e. the matchings or paths in which no two edges have the same label. When the point labels are chosen uniformly at random, and independently of each other, our matching algorithm with high probability (w.h.p.) delivers a nearly–perfect matching, a matching of size $n/2 - O(n^{1/3} \ln n)$. We show that, in sharp contrast, a near-perfect path is unlikely: w.h.p. the length of the longest path is below $0.96n$. (Received August 10, 2005)