1116-VF-2043 **Daniel J Poole*** (`poole@math.osu.edu`), 231 W 18th Ave, Columbus, OH 43210. *The giant strong component in random directed graphs.*

We study the random directed graph models $D(n,m)$ and $D(n,p)$. In 1990, Karp for $D(n,p=c/n)$ and independently Łuczak for $D(n,m=cn)$ proved that for $c>1$, with probability tending to 1, there is an unique strong component of size of order n. Karp showed that the giant component has likely size asymptotic to $n\theta^2$, where $\theta=\theta(c)$ is the unique positive root of $1-\theta=e^{-c\theta}$. We prove that, for both random digraphs, the joint distribution of the number of vertices and number of arcs in the giant strong component is asymptotically Gaussian with the same mean vector $n\mu(c):=(\theta^2,c\theta^2)$, and two distinct 2×2 covariance matrices, $nB(c)$ and $n[B(c)+c\mu'(c)^T\mu(c)]$. To this end, we introduce and analyze a randomized deletion process which determines the directed (1,1)-core, the maximal subgraph with minimum in-degree and out-degree at least 1. We show that the likely numbers of peripheral vertices and arcs in the (1,1)-core, those outside the largest strong component, are of poly-log order. By approximately the likely realization of this deletion process with a deterministic trajectory, we obtain our distributional result via exponential supermartingales and Fourier-based techniques. Joint with Boris Pittel. (Received September 21, 2015)